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ANALYSIS OF STANDARDIZED READING TESTS FOR READING-THINKING PROCESSES

by

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A THESIS

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ABSTRACT

The comprehension section of four commonly used standardized reading tests were analyzed to determine how effectively they assessed reading-thinking processes. The information obtained on processing activity identified two categories of processes - general and selected processes. The information obtained from the two categories were applied to several definitions of reading comprehension to help in the establishment of a theoretical framework for cognitive processing in reading comprehension.

The data collected from the research suggest that it is not feasible to assess a process singly. In addition, the frequency of use of the selected processes vary in the degree to which they are assessed. There is also evidence to suggest that there are some general processes which are phenomena of the testing of reading comprehension. The effects of task demands and other variables were another factor found to affect the processing activity of the testing of reading comprehension. The cognitive competencies of the comprehension tests were discussed in light of general processes, task demands, frequency of use of selected processes, and complexity of test items.

DEDICATION

I would like to thank my supervisor, Dr. Jenkinsen, for providing me with a learning experience that was both pleasant and informative. My knowledge and understanding of the process of learning were greatly enhanced by her professional advice.

My patient wife, Joan, deserves more than I can express. To my graduate friends, Grace McPike and Mim Carson, I wish to thank them for their help in this study.

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CHAPTER I

INTRODUCTION

Evaluation, using standardized reading tests, has been a topic of considerable concern for some time. Acland (1976), Goolsby and Frery (1976), and Rogers (1978) express dissatisfaction with standardized reading tests. The relationship of standardized reading scores to reading instruction has been questioned. What specific reading skills are measured on a standardized reading test? Does the test specify the strengths and weaknesses of the reader? The questions are endless but the answers are not forthcoming.

One possible solution to aid in the answering of the above questions is to look at what processes a reader is engaged in when involved in the completion of a standardized reading test. Within recent years, reading has been viewed from a process rather than from a skills perspective (Smith, 1975). To look at these processes in the analysis of a standardized reading test could lead to more constructive information about how children are actually reading and to provide for better implementation of instructional needs for a student.

This study, then, will deal with the analysis of four

of the major standardized reading tests in terms of the processes they assess. Only the comprehension section of the four tests will be considered.

BACKGROUND TO THE PROBLEM

When an individual becomes involved in a reading task, he must perform certain actions on the printed stimuli. There is a complex repertoire of integrated sequences of actions that a person uses to induce his own language and cognitive development. These actions are called processes (Smith, 1971; Fishban and Emans, 1972).

These processes are covert mental activities that are not amenable to direct measurement or observation. With the exception of the most recent research, the field of reading research as a process oriented activity has been fragmentary (Walker, 1973). The absence of a theoretical framework has been cited as one of the major reasons for the lack of explication of these processes. Of particular importance is the absence of a theoretical framework for measurement of reading comprehension.

Recent researches have especially expressed dissatisfaction with our present reading measurement instruments (Farr, 1968; Goodman, 1968; Simon, 1971). They suggest that the lack of diagnostic validity of reading comprehension stems from a poor understanding of the reading process. Schreiner (1977) suggests that tests must be created to reflect what is known about cognitive processing.

To develop such a test requires information relevant to a theoretical framework about processing activity as well as the knowledge that our present standardized tests can give researchers.

PURPOSE OF THE STUDY

The purpose of this study is to analyze four commonly used standardized tests (comprehension section) to obtain information on the assessment of processing activity for reading comprehension.

RESEARCH QUESTIONS

In order to investigate the above purpose, the following research questions were formulated:

1. What reading comprehension processes do the stated standardized reading tests assess?
2. What is the frequency of use of the reading comprehension processes in these tests?
3. Are some general cognitive processes phenomena of the nature of reading test formats?
4. Does the test format force certain cognitive competency demands on the reader?
5. If the assumptions inherent in research questions 3 and 4 are found to be valid, is it possible to separate reading and cognitive demands and devise test items to assess this?

DEFINITIONS

The definition of the reading processes was originally established from the background literature. As the study progressed the application of the definitions to the reading tests created a problem so they were redefined in light of the analysis. All of Chapter IV is devoted to these definitions. A summary of the derivations of the processes can be found at the end of Chapter IV.

LIMITATIONS OF THE STUDY

1. The results of this study in assessing the standardized tests for processes are specific to the stated tests. Only the format of the study can be applied to other tests because the results of the study are specific to the tests of the study.

2. The results of this study are obtained from one researcher's analysis of the tests and data and, thus, limit the validation of the study.

3. Tests involving oral reading comprehension were not included in this study.

4. Since the processes were so numerous in the literature, the researcher made the decision as to processes commonly involved in reading comprehension.

OVERVIEW OF THE PROCEDURE

The procedure used in this study involved the

choosing of four commonly used standardized silent reading tests to see if they contained cognitive processes. The data was collected on score sheets by analyzing each item of each of the tests to see which processes were assessed by that item. The score sheets for data collection were used to analyze the data. The initial data revealed two groups of processes which were named general and selected processes. This data led to redefining the processes in view of the initial data and analyzing the information a second time using the two groups of processes.

Extraneous variables, such as task demands and response modes, were discussed in relation to the findings. Comparison of the results for processes within and across tests was the final data analysis.

Approximately 25 percent of the items were collaborated by two other judges to obtain an inter-judge reliability.

SIGNIFICANCE OF THE STUDY

Research has indicated a need to know more about the assessment of the processing activity in reading. If the present study reveals that commonly used standardized tests do assess reading processes, then the information obtained may be beneficial in the modifying of present tests and in the construction of future tests for processing activity. In addition, information may be found that will help in the development of a theoretical framework for the assessment

of reading.

The development of a theoretical framework for assessments and/or a reading process test could have implications for developing reading programs in the future.

ORGANIZATION OF THE STUDY

The study will be presented as follows:

CHAPTER II - A Review of the Related Literature. This Chapter includes a definition of reading and several definitions of reading comprehension as a processing activity. Aspects of testing reading comprehension are discussed.

CHAPTER III - Design of the Study. This Chapter includes the design of the study, data collection and analysis, and the reliability of the analysis.

CHAPTER IV - Delineation of the Processes. This Chapter includes a clarification of the definitions of the processes in relation to the initial data analysis.

CHAPTER V - The Analysis and Findings of the Study. This Chapter includes the analysis of the data, discussion of the analysis in relation to the two categories of processes, and the comparison of the processes within and across tests.

CHAPTER VI - Summary, Conclusion, and Educational Implications. This Chapter includes a summary and conclusion of each of the five research questions as well as the educational implications of the study.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

This Chapter develops reading comprehension as a processing activity by presenting a definition of reading and several definitions of reading comprehension which involve the complex mental processes. The relationship of the processes of thinking, memory, and reading comprehension are explored as well as the nature of testing reading comprehension as a processing activity.

GOODMAN'S MODEL OF READING

Before this Chapter attempts to define reading comprehension, a part of the reading process, a definition of reading will be supplied. Carrol (1970), Goodman (1970), Pearson (1976), Smith (1971), and others have drawn attention to reading as the construction of meaning. Reading, then, is a constructive process (Goodman, 1968) in which level one deals with the reader's understanding of the graphic-phonemic, syntactic, and semantic features of the printed page. Level two deals with the interrelating of the smaller units into larger units. Finally, meaning is obtained in level three.

Meaning is obtained through the construction or

organization of the information from the printed stimuli. The actions imposed on the material are a continuum of cognitive processes created by thinking, memory, and comprehension (Furniss, 1978).

The actions imposed on the material and the meaning obtained are reading comprehension. Reading comprehension, then, is a process-oriented activity which has as its ultimate goal, meaning. To evaluate and compare this definition the following two sections present two views of reading comprehension. Both definitions acknowledge that the reader interacts cognitively and affectively with the material which results in a final response containing some level of meaning.

THORNDIKE'S DEFINITION OF READING COMPREHENSION

Thorndike (1917) put reading comprehension into a single statement, "reading is thinking." His following definition of reading comprehension has survived 60 years:

> Reading comprehension is a very complex procedure involving a weighing of each of many elements in a sentence, their organization in the proper relation to one another, the selection of certain of their connotations and the rejection of others, and the cooperation of many forces to produce the final response (p. 323).

An analysis of Thorndike's definition reveals the importance of memory and thinking to reading comprehension. The use of memory and thinking can be seen by looking at Gray's (1960) Major Aspects of Reading as well as

Guilford's (1959) Structure of the Intellect. Gray's model is connected to Guilford's model by a section on the relationship of thinking, memory, and comprehension.

GRAY'S MAJOR ASPECTS OF READING

Gray (1960) states that reading is an extremely complex process. He broke down the reading process into four major aspects - perception, comprehension, reaction to what is read, and fusion of new ideas and old. The first major aspect will not be discussed since reading comprehension is the focus of this study. The other three aspects are considered aspects of reading comprehension.

Assuming that perception has occurred then, the continuum of processes works, according to Gray, like this. As meaning associations are aroused, they are fused into a sequence of ideas. Memory is important to hold the meanings of the first words until those that follow are recognized. As meanings are recognized the reader reacts thoughtfully making judgements, responding emotionally, and combining with previous experience. Gray sees three essential elements of comprehension - to get a clear grasp of the literal meaning, to secure a fuller and more penetrating grasp of the message intended by the author, and to focus on the significance and the implications of the author's ideas as contrasted with what he has said. Gray (1960) refers to these three elements as the reader's ability to "read the lines, to read between the lines, and

read beyond the lines" (p. 17).

Gray recognizes certain skills necessary for comprehension. Some of these skills are the arousal of meaning associations with words, the fusing of separate meanings into a stream of ideas, the use of an inquiring attitude toward the meaning of the passage, and other skills. They develop the foundation of comprehension for the third aspect of reading - significance and implications of the author's ideas.

As the reader secures a clear understanding of what he has read, he reacts automatically or reflectively to the ideas acquired. The reader evaluates what is read in the light of sound criteria or standards. The requisites for the reader's evaluation include - ideas acquired and automatic reaction to them, an inquiring attitude, criteria of judgement (objective and subjective), conclusions reached, and emotional responses. The requisites suggest the actions that the reader must perform on the printed stimuli.

The fourth aspect of the reading process is called assimilation and is acquired by fusing the ideas gained from reading with past experience. The relationship between the ideas and the past experience begins as the reader adopts an inquiring attitude. (The concept of inquiring attitude or 'purpose' is present in all four aspects of reading.) The fusion of the old and new ideas result from the involvement of such mental processes as

analysis, comparison, selection, synthesis, and judgement (Gray, 1960). The product of the fusion represents new mental resources for use in future reading and thinking activities.

These activities involve the higher mental processes (Gray, 1960). Gray implies a "depth of processing" (Craik and Lockhart; 1972) when he says creative thinking involves the imaginative treatment of ideas in both inductive and deductive thinking and results in new insights, fresh ideas, and new organization of patterns of thought. It is what Stauffer (1969) calls "extending" or "refining" what is stated.

Gray states that "all mental processes that characterize clear thinking, sound judgement, and creative endeavours" including attitude, interest, past experience, and biases are included in the reading process.

The definition of reading and the viewpoints on reading comprehension previously presented imply a continuum of cognitive processes involving thinking, memory, and comprehension. In addition, the material presented implied varying levels of meaning. The following section will further elaborate on the relationship of thinking, memory, and comprehension.

RELATIONSHIP OF THINKING, MEMORY, AND COMPREHENSION

Recent researchers and theorists in comprehension and memory suggest that the reader, in making sense of the

world (Smith, 1971), utilizes a highly interactive group of complex processes to read and remember discourse (Furniss, 1978). Furniss states that "to a large degree the extent to which the processes are used are dependent upon the ability within the reader to implement acquisition and retrieval processes according to his purpose" (p.18). Her statement suggests variations within the processes in the acquisition of information depending upon the purpose of the reader. Her statement also suggests a strong relationship between thinking, memory, and comprehension.

The relationship among thinking, memory and comprehension can be seen in Stauffer's steps of the reading-thinking process (Stauffer, 1969). The three aspects of the reading-thinking process - declaring purposes, reasoning, and judging - are fundamental for active assimilation of the printed stimuli. Stauffer suggests that "the nature of the purpose to be achieved fixes the answer being sought and regulates the rate and scope of the reading-thinking process" (p.26). If, as Thorndike suggested, reading is reasoning, then the reader "manipulates the ideas to discover logical relations or he rearranges logical patterns in such a way that a conclusion can be reached" (Stauffer, 1969, p.27). Stauffer adds "reasoning is productive thinking and is to be contrasted with mechanical responses to previously learned stimuli or reproductive thinking" (p.27). Reasoning and purpose are necessary components of the evaluative process of judgement in which

the reader must "select and weigh the facts and make decisions that are pertinent and discriminate" (p. 27). The complexity of the evaluative process is dependent upon the task demands of the printed stimuli. These three components of the reading-thinking process have, according to Stauffer, a fourth aspect fundamental to intelligent, mature reading to learn - that is, refining and extending ideas. Stauffer is suggesting, then, that the reader is performing certain actions, operations, or processes on the printed stimuli that require active assimilation for learning to take place. In regard to this suggestion Stauffer (1969) leaves several premises about the reading process:

(1) The reading process is akin to the thinking process.

(2) Concept development and cognitive structures require early emphasis and soon take precedence over the mechanical aspects of word recognition.

(3) As a person reads and comprehends, he acquires new concepts.

(4) Hard-to-measure outcomes of critical and creative reading must replace tests that measure only superficial evidence of reading performance.

From these premises one can see the role of thinking to the reading process. Also, a variety of actions, operations, or processes must be performed on the printed stimuli to achieve different outcomes. Finally, attempts

to measure these processes should replace the more superficial tests.

The definitions of reading comprehension and the material presented so far show the importance of thinking in reading comprehension. The importance of memory will be developed in the next section as well as further developing the role of thinking.

GUILFORD'S STRUCTURE OF THE INTELLECT

Guilford's (1959) structure of the intellect model illustrates some of the processes involved in comprehension. He provides a three-dimensional model of the operations, content, and products of thinking. If, as Stauffer suggests, the reading process is akin to the thinking process, then the operations or processes suggested by Guilford are akin to the reading process. The reader then carries out various operations, that is, cognition, memory, divergent thinking, convergent thinking, and evaluation. Guilford suggests that the operations or processes combine with products and contents to produce a three-dimensional model for the structure of the intellect. He further suggests that reading is one of the most complex intellectual abilities (Guilford, 1960).

The major types of thinking abilities that are involved in reading are divergent production, convergent production, and evaluation (Guilford, 1960). The nature of the material in reading can determine the quality of the

intellectual abilities and the type of thinking abilities engaged. Guilford goes on to further suggest that the nature of testing materials and some reading materials require general thinking abilities as well as more selected thinking abilities. The types of general thinking abilities assessed by the tests were specific to the task demands of the tests. In other words, certain types of tests will require certain general processes as a result of the test format. Of all the tests mentioned, evaluation or judgement seems to be common to all, suggesting that this process becomes a function of a testing situation.

Guilford's model is important to this study since it not only acknowledges the operations or processes but also acknowledges a cross-over of the classification of intellect, namely, operations, products, and contents.

This cross-over is important in examining the reading demands on standardized reading comprehension tests. The content and product of each comprehension test has to be examined to help determine the operations or processes that are general and selective to the specific comprehension test.

The four reading comprehension tests used in this study had to be examined using the above criteria to determine which processes were general to each of the tests, which were general to all of the tests, and which of the processes were selective to each of the comprehension tests. The rationale for selecting the processes for this

study is found in the next section.

RATIONALE FOR PROCESS SELECTION

Difficulty arose when attempting to amalgamate all the literature to determine the processes used in the reading comprehension process (Walker, 1973). The definitions of reading comprehension previously presented acknowledged the importance of thinking and memory to the comprehension process but used different terminology to describe the mental operations, for example, the arousal of meaning associations with words (Gray, 1962) could be recognition and association (Smith, 1975) and the refining and extending of ideas (Stauffer, 1969) could be synonomous with Gray's (1962) third aspect of comprehension - significance and implications of the author's ideas. Additional difficulty arose when the description of such operations implied more than one mental operation. To overcome the problem of definitions of processes, the researcher used the terminology found to be common in the literature for reading processes and defined them in terms of the models of reading comprehension presented before.

Several factors were involved in the selection of the processes. The frequency of occurrence in the literature was one criterion. The criterion previously stated in the Guilford model was another. How closely these processes paralleled the definitions of reading comprehension presented before was the final criterion. Using these

criteria, the following processes were selected:

- recognition
- association
- prediction
- inference
- classification
- comparison
- generalization
  - (a) induction
  - (b) deduction
- sequencing
- judgement
- restatement
- synthesis
  - (a) phrase
  - (b) sentence
  - (c) discourse

The processes appear in the order that they appear in the data analysis sheet in Appendix A. Since the processes were dependent upon the test format (Guilford, 1960; Stauffer, 1969), the definitions for the processes are provided in a later chapter as they result from the analysis of data. The definitions are based on the models of reading comprehension presented before but are specific to the tests used in this study.

ASPECTS OF THE TESTING OF COMPREHENSION

Since the early 1900's, the field of reading has experienced hundreds of standardized tests of a wide variety of reading skills and abilities. Standardized-normative tests have been the most common way of assessing a student's reading performance. Scores are compared to a norming population to put the student into a certain classification of performance relative to the norming

group. Research has cast doubt on the validity and the reliability of all tests instruments in general and on group standardized tests in particular (Farr, 1968). Farr further states that measurement has to be intertwined with psychology and the teaching of reading since research cannot substantiate that specific sub-skills can be validly measured. Simon (1971) agrees when he states that the degree to which extraneous variables are measured are not accountable in present standardized tests. Hunt (1955) and Farr (1968) both question the diagnostic validity of subtests of reading. Goodman (1968) and Simon (1971) attribute the lack of diagnostic validity to a poor understanding of the reading process. Prentice and Peterson (1977) suggest there is a need to go to a psycho-linguistic definition of reading.

A poor understanding of the reading process (Simon, 1971), then, makes it almost impossible to separate a student's cognitive skills from his comprehension skills. Schreiner (1977) suggests that if measurement instruments of reading comprehension are to have construct validity, they must be created to reflect what we know about cognitive processing. Stauffer (1969), in his fourth premise stated earlier, reinforces the need of tests to assess processes.

To assess processing what is needed is a theoretical framework of reading as a processing activity. Walker (1973) states that such a framework does not exist. This

study is not attempting to establish such a framework but to provide information that will lead to the establishment of such a framework. Rather, this study is attempting to analyze the test items of four commonly used standardized reading tests to determine the degree to which the test items may be used to assess the processing behavior of students while they are reading. The results of such a study should help in providing information necessary for constructing reading tests that assess the reading-thinking process as well as provide information on processing in our present tests.

The discussion on the structure of the intellect (Guilford, 1960) suggested the importance of content and products as well as the mental operations in the testing of reading comprehension. The next section will discuss aspects of contents and products which affect the testing of reading comprehension. The aspects of contents and products are variables which affect the amount and type of learning that takes place.

VARIABLES WHICH AFFECT THE TESTING OF READING COMPREHENSION

Reading is a demanding task. According to Stauffer (1969), it demands "a command of thinking skills as well as reading skills." He defined the steps related to thinking and reading. These steps (found in an earlier section) are affected by variables (Thorndyke, 1975).

Thorndyke (1975) states that learning with prose material depends on variables influencing the student's approach to the material. "These variables include the task which subjects are required to perform, their purpose and goal in reading the material, and the constraints of the processing environment" (p. 3-4). All of the variables are important to this study. Learning is affected by these variables. The task is a function of text characteristics and the type of processing activity. The type of processing activity on standardized tests is restricting and therefore puts constraints on the processing environment. The main purpose of a standardized test, that of measurement, is already established for the readers. There may, however, be subsidiary purposes demanded of the reader in terms of the specific test content or item. The amount and type of learning that takes place in the completion of reading tests is limited.

The present study, while not concerned specifically with learning, is concerned with the reading comprehension process which implies that some learning does take place. The fact that text characteristics, response modes, and task demands change or vary within the four tests suggests that the reader will have to make some modifications in task expectations and processing activity depending on these variables.

Text characteristics and task demands determine both reading and cognitive involvement (Thorndyke, 1975). Prose

material differs from word lists not only in syntactic complexity but in its inherent organizational structure dictated by such conventions as topic and context. Since the topic of each passage differs in the four standardized tests the amount of past experience that the reader brings to the response modes will be proportional to his familiarity with the topic of each test item. The response modes of the four standardized tests create a schema (Bartlett, 1932) that allows for a higher number of inferred concepts (Frederiksen, 1975).

The reader then is more than reconstructing ideas into an organized array of information, but is having the task demands of the tests influence the number and type of processing activities. The task demands of the test include the organization of information from the word level, the sentence level, and the passage level.

The text characteristics and task demands are also influenced by two types of response modes - multiple choice and cloze multiple choice. The response modes also affect the processing activities since the generation of processes is task sensitive (Thorndyke, 1975).

In analyzing the processes involved in the reading tests analyzed for this study, these variables will need to be considered.

SUMMARY

Reading comprehension is a mental processing activity involving many reading-thinking processes. The ultimate goal of reading comprehension is meaning. The testing of comprehension as a processing activity has been neglected. Many variables were discussed in the testing of reading comprehension as a processing activity.

The next Chapter will present the design of the study.

CHAPTER III

THE EXPERIMENTAL DESIGN

This Chapter explains and describes the selection of reading tests, the data analysis, and the reliability of the analysis.

SELECTION OF READING TESTS

The four tests chosen for analysis of processes involved in reading comprehension are:

Stanford Achievement Test (Reading) (Form W)
Gates-MacGinitie Reading Tests (Survey E, Form 2M)
Metropolitan Achievement Tests (Advanced, Form F)
Canadian Tests of Basic Skills (Form 3).

One form of each of the four tests was analyzed for reading processes.

The four tests were chosen because they were the most frequently used standardized reading tests at the grade seven to nine level in the Alberta school system as indicated in Report of Task Force on the Evaluation of Standardized Achievement Tests for Alberta Schools (1977). The level of these tests which corresponds to the grade seven to nine level was chosen because of the researcher's background in the teaching of students at this level and the

administration of standardized tests at this level. None of the stated tests were normed on Alberta populations.

Stanford Achievement Tests (Reading)

The Stanford Achievement Test was chosen for this study because of frequency of use at the Grade 7 to 9 level (Report of the Task Force on the Evaluation of Standardized Achievement Tests for Alberta Schools, 1977). The American edition of the test was used because the only significant changes made from the U.S. to the Canadian edition was the substitution of metric units, which were considered in the task force report to be poorly constructed and invalid (p. 17). A further reason why the Stanford Achievement Tests were chosen was the ratings of the Centre for the Study of Evaluation found on page 78 of the task force report. The centre rated the reading comprehension section as "good" under the category "examinee appropriateness" and "fair" for "administrative usability" and "normed technical excellence."

Since the study was concerned with the assessment of reading processes the reader is involved in when he is interacting with the content, the category "examinee appriateness" was the most important category. Therefore, the good rating for "examinee appropriateness" was the other reason for this researcher to choose the Stanford Achievement Tests.

The Stanford Advanced Paragraph Meaning Test, Form W

(1964, 5 pages) is a subtest of the Stanford Achievement Tests. It consists of paragraph meaning only. This subtest is found in the first five pages of the Stanford Achievement Test, Complete Battery (Advanced Level). The advanced battery is primarily designed for use from the beginning of grade seven to the end of grade nine.

The response modes for Stanford Achievement Test include both multiple choice and cloze-multiple choice.

The Paragraph Meaning Test, according to the manual, consists of a series of paragraphs increasing in difficulty. One or more words have been omitted from each paragraph. The pupil's task is to demonstrate his comprehension of the paragraph by selecting from four choices the proper or best choice for each omission. The subtest also includes complete paragraphs about which questions are asked, to be answered by selecting one of the possible choices. The total number of items is 60.

The test can be scored by both hand and machine. Scores on Stanford Achievement Tests may be translated into grade scores, grade equivalents, percentile ranks and stanines.

Reviews of the tests have yielded both positive and negative comments. Positively, Townsend (cited in Buros, 1968) states that one advantage of the Stanford Achievement Tests is that the examiner can use the Paragraph Meaning Subtest with or without the rest of the battery. In addition, there are five comparable forms for each level

which makes it useful for testing at alternate intervals for comparison. Hobson (cited in Buros, 1968, page 182) further comments positively by stating the test has good standardization and good content validity for paragraph meaning up to the end of grade 10. Traxler, in a later review in Buros (1975), adds another positive aspect of the Stanford test when he states that the latest edition of the test (1964) takes into account "modern changes in theory and practice of reading instruction in techniques of testing" (page 82).

Negatively, Robinson (cited in Buros, 1968) stated that the test which involves filling in the blanks correctly depends on getting the facts or details and securing implied meaning but lacked broader goals than fact and inference. Townsend (cited in Buros, 1968) affirms the criticism of Robinson by acknowledging the limited pattern of reading testing. He further goes on to say that the Manual gives no description of reading parts. Such lack of information, according to Hobson (cited in Buros, 1968), make it difficult for making use of individual test results in an analytical or remedial way.

Gates-MacGinitie Reading Tests (Survey E)

The Gates MacGinitie Reading Tests, like the Stanford Achievement Tests, were chosen for this study due to their high frequency of use in the Alberta School System. In addition, the Gates-MacGinitie (Comprehension) was given

identical ratings to the Stanford test by the Centre for the Study of Evaluation Ratings (Report of Task Force, 1977). The "good" rating for the "examinee appropriateness" qualify it as a good test to examine for reading processes (page 78 of the Report, 1977).

The response mode for the Gates-MacGinitie Reading Tests, Survey E, comprehension section is cloze multiple choice. Intermittent blanks appear in the passages for which the reader must select the appropriate word from five choices found below the passage.

The Survey E level of the Gates-MacGinitie Reading Tests is part of a series of tests designed to cover grades 1 through 12. This 1964 edition of the tests replaces the Gates Primary and Advanced Primary Reading Tests and the Gates Reading Survey. The Survey E level of the latest edition was constructed for grades seven to nine. The level contains three sections - speed and accuracy, vocabulary, and comprehension.

Only the comprehension of the Survey E (Form 2M) will be considered in this study. The following paragraph is a description of the Comprehension Test found in the 1965 edition of the Teacher's Manual:

> The Comprehension Test measures the student's ability to read complete prose passages with understanding. It contains 21 passages in which a total of 52 blank spaces have been introduced. For each blank space a choice of five completions is offered. The student must decide which one of the five completions best

> conforms to the meaning of the whole passage. The first passages are simply written, but the later ones become progressively more difficult (page 1).

Scoring of the answer sheets can be done by hand or by machine. The raw score of the Comprehension Test is the total number of items for which the student chose the right answer. The raw scores can be converted into grade scores, percentile scores and standard scores. The manual also allows for a comparison between scores, e.g. standard score on the Speed and Accuracy Test with the standard score on the Comprehension Test.

The Survey E has three forms which allow for semi-annual, annual, or periodical check of progress from grade 7 to 9. They are forms 1M, 2M, and 3M.

Reviews of the Gates-MacGinitie Reading Tests reveal little. Burke, Powell and others found in Buros' Reading Tests and Reviews (1968, 1975) indicate limitations of the tests. Burke and Powell (Buros, 1975) suggested that the authors do not present their view of the reading process or their rationale for the focus of the tests. Much of the information not presented might be provided for by the information obtained in the analysis of reading processes. Under the section of Comprehension in the manual, Burke questions the statement, "the student's ability to read . . . with understanding." Since no definition of understanding is put forth by the authors, Burke (1975) and Powell (1975) (cited in Buros, 1975) and Spache (cited in

Buros, 1968) acknowledge the limited value of the information obtained from the tests if information is needed about specific reading skills and/or processes. Reading process analysis should provide one mode of diagnostic information into the type of "understanding" that the tests purport to measure.

Spache (Buros, 1968) and Burke and Powell (Buros, 1975) note that the tests measure comprehension that require largely inferential thinking. As this is a skill not often stressed in classroom (Spache cited in Buros, 1968) the tests would not measure the same thinking as classroom performance. With such an emphasis on inferential thinking, the analysis of this test for reading processes might provide useful information on the processes used to complete this test. The comparison of the processes in this test to other standardized tests that assess higher levels of processing information should reveal the delimiting effect of processing information for reading comprehension in the Gates-MacGinitie Reading Test. Burke predicts such results in comparison when she acknowledges that the tests assess "processes in isolation" due mainly to the length and the lack of development of reading selections. She does not, however, state what processes are being assessed. Such information may be provided by this study.

Metropolitan Achievement Test (Advanced)

The Metropolitan Achievement Test was chosen for this study for the following reasons. The test was ranked fourth (Report of Task Force on the Evaluation of Standardized Achievement Tests for the Alberta Schools, 1977) on the frequency of mention by Alberta school systems reporting the use of the tests. In addition, the Metropolitan was rated higher than any other test at this level for reading comprehension. The test received a "good" rating for "examinee appropriateness" and "administrative usability" by the Centre for the Study of Evaluation Ratings as reported by the Task Force Report (1977).

Under the subsection "Comprehension" of the category "Examinee Appropriateness", the centre rated "Item Appropriateness" and "Item Relevance" full scores within the rating range. "Item Difficulties" of the Comprehension section was rated average. All other categories under the "Examinee Appropriateness" were rated above average except for one, Administration of Instruction.

The high ratings by the Centre for the Study of Evaluation Ratings and the frequency of use in the Alberta school system, were two major reasons for choosing this test.

The Metropolitan Achievement Tests are a series of measures designed to tell teachers and administrators how much pupils have learned in important content and skills areas of the school's curriculum. The Advanced level is

designed to correspond to the grades 7 to 9.5.

The Advanced level, Form F, of the reading tests has two sections - Word Knowledge, and Reading. This study will only deal with the Reading section which has 45 items. According to the manual, the 45 items measure "public ability to comprehend written material" (page 2). After a pupil reads a paragraph he is required to answer questions which call for comprehending literally stated material, drawing inferences from a passage, identifying main ideas and determining word meanings from context.

The response mode for the Metropolitan Achievement Test is multiple choice. Passages are followed by a statement which is to be completed by choosing the best answer from four choices. The choices include single word, multiple word, and phrases.

The scoring of the test can be done by hand or by machine. Two manuals are needed, however, for full administration and scoring of the test. Teacher's Directions are needed for actual administration while the Teacher's Handbook is needed for the scoring and interpretation of the test. Norms for the tests were developed in such a way that each battery can be used in grades above and below those for which battery was primarily intended.

Virtually all new materials were created for this edition (4th edition) of the Metropolitan Achievement Tests with all the material being tried out in classrooms across the United States.

In a review by Robinson, found in Buros (1968), he rates the Metropolitan as a good survey instrument. This evaluation by Robinson concurs with earlier statements by Hobson (cited in Buros, 1968) and McKim (cited in Buros, 1968), when they suggest that the Metropolitan is outstanding for general estimates of paragraph reading ability.

The advanced levels contain paragraphs aimed at measurement of four comprehension skills: main idea, details, inferences and meaning from words in context. What is lacking, Robinson, Hobson and McKim postulate, is a need to supplement the test for diagnostic purposes. Robinson says the tests authors need to "provide methods of analyzing strengths and weaknesses in the four comprehension skills" (cited in Buros, 1968, page 312). Although the Metropolitan was lauded as a good survey, the low diagnostic value of the test led the reviewers to suggest a supplement for diagnostic purposes. Robinson suggested that a device for analysis be worked into the scoring. McKim suggested a supplement analysis. This study is attempting to provide such a supplement by analyzing the Metropolitan Test to see if the items of the test assess specific reading processes. Dignosis of a reader's information processing, will enable the diagnostician to make judgements of how a reader is dealing with the printed stimuli.

Canadian Tests of Basic Skills
(Form 3) C.T.B.S.

The main reason the C.T.B.S. was chosen for this study was because of its Canadian content and norms. Another reason was that Form 3 was constructed to facilitate individualized testing at different stages of development (Teacher's Guide, 1974). It is also one of the four most commonly mentioned standardized tests used in the classrooms of the Alberta School System (Report of the Task Force on the Evaluation of Standardized Achievement Tests for Alberta Schools, 1977). In addition, it was given an overall rating of fair for the three categories - Examinee Appropriateness, Administrative Usability and Normed Technical Excellence. These ratings were obtained from the Centre for the Study of Evaluation Ratings on the Iowa Tests of Basic Skills from which the C.T.B.S. was adapted. Local ratings by the Technical Adequacy Assessment Committee of the Task Force rated the C.T.B.S. as "good".

The C.T.B.S. was chosen, then, for the following reasons - Canadian, frequency of use, and ratings.

The response mode for the C.T.B.S. is the multiple choice format. For the reading comprehension section, passages of varying length and difficulty are read. Questions follow the passages and are to be answered by choosing the one answer that the reader thinks is better than the others. There are four choices to choose from for each

question with the format of choices ranging from a single word to sentences.

The Canadian Tests of Basic Skills are eleven separate tests covering a wide range of skills development. The skills development are organized into six levels, all of which are contained in a single 96-page booklet. The section this study will be concerned with is Section R, Reading Comprehension section of the Levels Edition, Form 3.

In over 19 pages, Test R covers six levels ranging from grades 3 to 9. Levels 13 and 14 cover the skills development designated as grades 7 to 9. It contains 98 items over 10 pages. According to the manual, the skills tested in Test R may be classed under four headings: details, purpose, organization and evaluation.

The content of the test has been very carefully selected to represent "the best of curriculum practices and to reflect current emphasis upon social utility and relevance for a diverse population (Manual, page 4). Since the data cannot be found concerning the Canadian Tests of Basic Skills, its counterpart, Iowa Tests of Basic Skills, upon which the Canadian edition was based, was reviewed.

According to Morgan, the Iowa tests are evaluative, that is defined as measuring generalized educational skills over a wide range of ability rather than mastery of specific facts or topics (cited in Buros, 1968, page 34). The focus is on generalized intellectual skills. Herrick (cited in

Buros, 1968) argued that the measurement of these intellectual basic skills is valuable for use in the development of instructional and individualized needs. The reviewer further said, however, that the Iowa tests do not pay "enough attention to the appraisal of those intellectual processes and skills which are part of the process of knowing and comprehending." He went on to underscore the need for the rapid expansion of tests into additional areas of intellectual skills. It is assumed that the same needs can be generalized from the Iowa to the Canadian Tests of Basic Skills. The present study should allow for the appraisal of those intellectual processes involved in reading comprehension.

DATA ANALYSIS

Recording of the Analysis

Each item of the four standardardized tests was analyzed for the processes, as stated in Chapter II, that were required to complete each item. The coding of an item in the assessment of a process was done with a plus (+) and minus (-) matrix system. A process received a plus if it was deemed necessary to complete a specific item. It received a minus if it was deemed unnecesary for a specific item. Problems arose, however, in the coding of an item for a process.

Each item required more than one process to complete

the item. In addition, some of the processes were necessary for all the items on all the stated tests. Some of the processes were necessary for all the items of a specific test. Further, there was a general problem of definitions that made analysis difficult. The problems were predicted by the background literature (Guilford, 1960).

It was previously suggested that the nature of the material in reading determines the quality of the intellectual abilities and the type of thinking abilities engaged. The types of thinking abilities were specific to the task demands of the tests. In addition, there were general and selective processes specific to a certain test (Guilford, 1960). If such premises are correct, then the categories of general and selected processes as well as the definitions must come from the analysis of data.

An example from one of the processes explains the difficulty in the ambiguity of the process definitions. Judgement was originally defined as the process of drawing conclusions by selecting and weighing the facts. The researcher struggled with the problem of whether the selecting and weighing of the facts came from the passage, the response mode, or both. In addition, the conclusions drawn were indicated in the form of alternatives in the response modes. Therefore, the reader was not necessarily drawing a conclusion but selecting one. The necessity to clarify the process of judgement as well as the other

processes became apparent.

The initial item analysis for processes revealed that the processes were reliant on the task demands of the tests. This analysis was used to arrive at very precise definitions of the processes in the nature of testing reading comprehension. The delineations of these definitions of the processes are described in Chapter IV as they result from the design of the study.

The revised definitions of the processes were then applied to obtain the results from the score sheets in Appendix A. They were also applied to obtain the inter-judge reliability.

The following section discusses how these results were analyzed.

Results of the Analysis

The results of the coding of items for each test to see if they assessed reading processes were put on score sheets found in Appendix A. From these score sheets, raw scores and percentage scores were calculated in Table 5-1.

The raw scores were used to compare the number of items which assessed a specific process within and across tests. The percentage scores were calculated from the raw scores. They were obtained by dividing the number of items which assessed a specific process by the total number of items. The percentage scores were used to discuss the frequency of use of a particular process within and across

tests.

The initial data analysis revealed that there were certain processes general to the nature of the testing. These processes were necessary to complete all the items in all the stated tests. Other processes were often found to be necessary to complete all the items on a specific test. Still other items were found to be necessary to complete only some of the items on any of the four chosen tests. The processes general to the nature of the testing were separated from the other processes called selected processes. The separation of the general and the selected processes was necessary since the results of the general processes within and across the tests revealed little information on the assessment of the reading process other than the fact that they are necessary to complete each item of each of the stated tests. The results of the selected processes were, therefore, isolated.

The results enabled the comparison of the frequency of use of the selected processes within and across tests. The comparison of the frequency of use of each of the selected processes was also compared to the averages of the sum of the percentages of selected processes in Table 5-2. The comparison was valuable in assessing the frequency of use for a selected process to the average of the selected processes.

The discussion of the frequency of use within and across tests for Tables 5-1 and 5-2 were done in separate

sections for each selected process. Reasons for obtaining a certain percentage score on a certain process are discussed in the individual sections.

The results of the score sheets found in Appendix A were used to determine the number of processes necessary to complete each item of each of the tests. These results are presented in Table 5-3. The information was used to assess the complexity of items to assess processes assuming that an increase in the number of processes necessary to complete an item increases the difficulty of that item to assess a single process.

Reliability of the Analysis

The reliability of analysis was established by comparing the results of two outside judges, each completing a Master's degree in reading at the University of Alberta, with a third judge, the researcher of the study. Approximately twenty percent of the items were selected for the inter-judge reliability by choosing every fourth item of each of the four standardized tests. Each item was analyzed, using the revised definitions of reading processes.

The Arrington formula was then applied to determine the amount of agreement between the three judges. The following formula (Clarke, 1978) was the form used in the study:

$$\frac{2 \times \text{agreement}}{2 \times \text{agreement} + \text{disagreement}}$$

The degree of agreement determined by the application of the Arrington formula is shown in Table 3.1.

Table 3.1

Inter-Judge Agreement of Analysis

	Agreement	Dis-agreement	Total Items	Per-centage
Judges 1 and 2	424	56	480	.94
Judges 1 and 3	411	69	480	.92
Judges 2 and 3	365	115	480	.86

The percentage of agreement was .86 to .94.

Summary

The data analysis of this study had revealed a need for more precise definitions of the reading processes as suggested by a review of the research. The delineation of these definitions follows in the next Chapter.

CHAPTER IV

DELINEATION OF THE PROCESSES

Data analysis of Chapter III showed the difficulty in delineating the processes involved in reading. Results of the initial analyses of the tests allowed the researcher to arrive at more workable definitions of the processes. The difficulty of the initial definitions was the inability to distinguish if and how a process was being used. Judgement was used as an example to show the difficulty in arriving at precise definitions of the processes. For the analysis definitions were needed that could not be interpreted or used in more than one way.

Previous discussion on the model of the intellect (Guilford, 1960) suggests that there were also some processes that were present in most test situations. Since all the tests used in this study are reading comprehension tests, the researcher anticipated certain processes would be general to all four stated tests. Another category of selected processes was also anticipated.

To arrive at the categories and the precise definitions, the researcher used the data from the initial analysis. Results of the analysis revealed that there were five processes common to each item of the four stated

tests. The initial percentage scores for these processes were 100 percent. These are the processes that will be referred to as general processes to the testing of reading comprehension in the four stated tests. The second category was the selective processes; that is, those processes necessary to complete only some of the items of the four stated tests. The selective processes are discussed following the next section on general processes.

GENERAL PROCESSES INVOLVED IN READING TESTS

Certain general processes were common to the four stated tests. These tests required the use of paper and pencil for the replies. This section proposes that the general processes are not only a product of reading comprehension but of the format of paper and pencil standardized tests in general. Similar format in other types of testing was used to show the comparison to the testing of reading comprehension. The testing of "Arithmetic Concepts" to "Paragraph Meaning" will be used as an example of how the general processes were a product of the format and the task demands of a particular standardized test. The processes referred to as general are: recognition, association, judgement, phrase synthesis, and sentence synthesis.

Since "Arithmetic Concepts" and "Paragraph Meaning" both come from the Stanford Achievement Tests, the format of the pencil and paper test is the same. Item 24 of the

"Arithmetic Concept" states:

24. 60% of 2150 is nearest ---

(e) 1300 (f) 1500 (g) 1200
(h) 120

To arrive at the answer, the reader is required to recognize, associate, make a judgement, as well as synthesize information both at a phrase and a sentence level. Similar examples from "Study Skills", "Social Studies", and "Science" show that these general processes become test phenomena of format rather than reading comprehension test phenomena. Some processes are inherent in the testing procedure while other processes are artifacts of the testing of reading comprehension.

Although general processes became test phenomena due to the format of the tests, there was difficulty in the application of definitions for item analysis. There came a need to define the general processes very carefully since the general processes were being defined for testing in general rather than the testing of reading comprehension. A look at the reading of a book in comparison to the reading of a test show the variance of reading tasks. While reading a book, a reader is required to interrelate information within and across paragraphs. The reader can react the way he chooses to the writer's intended message. While reading a test, a reader must read a passage which requires certain types of response modes. The way he reacts and interrelates information is governed by the type of

response mode and/or the question asked. The reader is being governed by the constraints of the test format. His reading of the reading test becomes an artifact of the testing procedure. It was, therefore, necessary to define the general processes in light of the reading task required.

Each of the following general processes was defined in terms of the test items from the Gates-MacGinitie Reading Tests (Survey E, Form 2M). This test was used since the other stated tests have long passages before the test items, so examples from these long passages would unnecessarily lengthen explanations. The general processes were, recognition, association, judgement, phrase synthesis, and sentence synthesis.

Recognition

Gray (1962) states that "as meaning associations are aroused, they are fused into a sequence of ideas . . ." that the good reader ". . . holds in mind . . . until those that follow are recognized" (p. 19). Gray's statement suggests that the good reader holds in mind the meaning of the first words until he recognizes those that follow. The following example:

1. Skin divers who go into very cold water may wear a rubber suit for ____.

1. insulation (A) style (B) food (C) lubrication (D) air (E)

from the Gates-MacGinitie Reading Tests shows the reader

must recognize the meaning of the word "insulation" before the meaning of the sentence is complete. The simultaneous occurrence of other processes is acknowledged to make the meaning of the sentence clear. The necessity of the process of recognizing in dealing with the above item can be seen by the interrelation of the word "insulation" with the other words in context. Therefore, the process is obtaining the verbal meaning in context.

> Recognition is the process of obtaining the syntactic and semantic meaning in context.

Association

As the meaning of a word is recognized, the reader reacts thoughtfully to the ideas acquired by combining with past experience (Gray, 1960). To answer item number one of the Gates-MacGinitie Reading Tests, the good reader must have past experience or semantic-associational experience for "skin-diver", "cold water", "rubber suit", and "insulation".

Items 32 to 34 of the same test also show examples of associating:

> The surface of the ocean bed can be mapped accurately and rapidly by using a modern sounding apparatus. Depth is measured by the length of time it takes __32__ to travel from the surface to the __33__ of the ocean and to be __34__ back again.

To answer item 32 with the word "sound", the reader must have semantic-associational experience for "sounding",

"ocean bed", "depth", "apparatus", and "mapping". Similar semantic-associational experiences are needed to answer items 33 and 34.

> Associating, then, is the process of combining past experience with the syntactic and semantic meaning of a word or words recognized. This definition acknowledges both the denotative and connotative aspects of the association.

Judgement

Whether the test item is cloze multiple choice or multiple choice, the nature of the task demands on the reader determines the weighing and selecting of the facts presented in the passages to make a judgement or a decision as to what answer is the best choice from the alternatives given in a test item. Selecting from the alternatives is not identical with formulating one's own view. Formulating one's own view comes at a higher level of information processing (Gray, 1960; Stauffer, 1969). Gray (1960) suggests three requisites for evaluating what is read - selecting relevant standards, making judgements, and checking conclusions. The relevant standards used in completing items on these standardized tests would be to select one best answer out of a possible five choices. The decision has to be based upon selecting and weighing facts in the passage. An example follows:

> Tacitus was a great Roman historian who described the empire during the first century. He looked with disfavor upon

the exalted Roman emperors and 38
them with sharp biting phrases.

38. glorified governed ignored
A B C

criticized worshipped
D E

A selecting and weighing of the facts - "disfavor", "described", and "sharp biting phrases" - leads the good reader to choose "criticized" as the best answer for item number 38. By considering all the five choices, the good reader is also weighing the alternatives given by the test constructors and checking his choice in light of the four alternatives.

> Judgement is the process of selecting the best choice or answer from the alternatives given by selecting and weighing the facts in the passage and checking that choice in light of the alternatives.

Synthesis - Phrase and Sentence

Synthesis is the process which fits together information into a framework or unit of meaning. The reconstruction of this framework of meaning falls into two categories. The storing of information in memory is called input information. The retrieval of information is called output information. Test formats demand output information. When a reader is asked to retrieve information, he uses two processes, recall and recognition. Recognition implies straight association with the printed stimuli or nonsense memorization (Smith, 1975). Recall implies both a number of associations and a synthesis of this information.

Recall is being tested but recognition is not in the format of the four stated tests.

Several points need clarification in the last sentence. The recognition process discussed in this section is not to be confused with the general process of recognition. The testing of recall is restricted to the synthesis of information as determined by the response modes. The alternatives given in the response modes govern the number of associations and the synthesizing of these associations into a framework of meaning. Therefore, a restricted recall is being tested in these test formats.

An examination of test formats reveals that standardized tests require the interrelation of information into a framework of meaning. Whether the skill tested is speed and accuracy, arithmetic concepts, science, punctuation, or paragraph meaning, the reader is required to interrelate information into a framework of meaning. An examination of the test formats revealed that the reader is required to fuse information into a sequence of ideas at the phrase and sentence level. The fusing of ideas beyond the sentence level, or discourse synthesis, also occurred. Since discourse synthesis did not occur in every test item, it will be discussed in the next section under "selected processes". Synthesis at the phrase and sentence level become phenomena of test formats and, thus, general processes. An examination of the stated test formats led to a definition of synthesis that includes phrase

and sentence synthesis.

In the format of silent reading tests to assess comprehension, there are passages of at least one sentence in length. The fusion of meaning into a stream of related ideas must occur at the phrase and sentence level. Examination of the test items reveals the fusion of meaning at both these levels. In the following items, 9 and 10, of the Gates-MacGinitie Reading Tests

> In the forest conservation program, land is often put under the __9__ of trained foresters who make sure that __10__ cutting and replanting methods are used.
>
> 9. rangers regiments supervisors work management
>
> 10. proper uncritical undesirable forest censured

the answers to item 9, "management", and item 10, "proper", cannot be achieved by associations and fusing of information at the phrase level, e.g., "under the management", but rather the associations and interrelating of information from the whole sentence. The recall or synthesizing of information occurs in the stated tests at least at the sentence level so phrase and sentence synthesis become general processes. Recall, in the above example, is restricted to the passage structure and the response modes.

Variables which affect the recall of information become important in the testing of recall. Meyer (1971) stated that:

> ...passage structure alone (including relationships) is not the only factor

> which determines the likelihood of units in the passage being recalled. The nature of the content occupying specific positions in the structure appears to have substantial effect on whether these items will be well or poorly recalled (p. 24).

Text characteristics, task demands, content, and other factors have an effect on recall. Unfortunately, these variables are not accounted for in the stated tests. Straight memory recall is not measured in general. Rather only recall in the form of associations and synthesis of information is amenable to measurement. The awareness of these variables and what can actually be measured led to the following definition of synthesis:

> Synthesis is the process of recall of a number of associations, as determined by syntactical structures, and the reconstruction of these associations into a framework of meaning by the recognition of the best alternative of the response modes. "Phrase" and "sentence" are words to describe the syntactical structures and the number of associations. The discussion in the next section on discourse synthesis will only deal with differentiating it from phrase and sentence synthesis.

SELECTED PROCESSES IN READING COMPREHENSION TESTS

Selected processes of reading comprehension to silent reading tests are discussed in this section. In the initial analysis processes other than the general processes were scored necessary to complete the items of the four tests. These processes were the selected processes

which have been suggested as common by the literature but which may not be found in every test item.

The definitions of the processes derived from the literature were not precise enough for the initial data analysis. Therefore, the initial anlaysis was used to redefine the selected processes. The redefinitions of the selected processes appear in the following order:

- prediction
- inference
- classification
- comparison
- generalization
  - (a) induction
  - (b) deduction
- sequencing
- restatement
- discourse synthesis

The processes are listed in this order not because of priority but because this was their chronological order for the selected processes on the researcher's score sheets.

Prediction

Smith (1975b) says that a reader is able to predict what a writer is about to say because the reader is able to reduce uncertainty in all aspects of his perception of the world and because the reader has the prior linguistic knowledge of how the writer is likely to express his intentions in surface structure. The reader uses knowledge of the world (semantics) and knowledge of language (syntax) to predict or anticipate what may happen in connected discourse. The application of prior knowledge to the printed stimuli by the reader in his endeavor to anticipate meaning

is called prediction. Through his expectations the reader samples the surface structure, syntactically and semantically, looking for limited matches of correspondence. The reader is then bringing a limited set of alternative meanings to the surface structure. From this he uses his knowledge of the world (meaning) and knowledge of language (morphology and syntax) to process the writer's intended message.

The process of prediction changes in the test format task compared to a reading of a book task. For example, in the reading of a book or a passage, the reader can predict the likely alternatives of the next word or few words if the reader knows where the writer is headed. As these expectations are confirmed or unconfirmed, the reader modifies expectations of words to follow. Thus, in the sentence "The captain told the mate to drop the _____" the reader would have certain expectations of the word to go into the blank. By the syntactic construction of the sentence, the reader can predict that a noun will follow the determiner, "the", the words, "Captain", "mate", and "drop", will give certain semantic cues for prediction by the reader. If the reader predicts the word "anchor", he need only cue in on a few of the features of the word to confirm or deny the prediction. Prediction, as it is explained in the above, is not used as a definition in this study.

In the reading of the silent reading tests, the

reader is required to read passages varying in length and response modes. The response mode of cloze multiple choice allowed the reader to predict or anticipate what word may be used to fill in the blank. The reader brings a limited set of alternative meanings to the surface structure. The reader must interrelate the information up to the point where the blank occurs and not require the information beyond the blank to arrive at the anticipated answer. The reader then goes to the answers to check his expectations and eliminate the alternatives. An example of prediction from the Gates-MacGinitie Reading Tests shows the type of prediction processing that can be assessed in the four stated tests:

> Skin divers who go into very cold water may wear a rubber suit for __1__.
>
> 1. insulation (A) style (B) food (C) lubrication (D) air (E)

The distinction in the processing activity for prediction was necessary since it is not possible to analyze when the reader is predicting in continuous discourse. It became necessary, therefore, to define precisely prediction so that it was specific to the testing of reading on silent reading comprehension tests.

> The process of prediction, as used in this study, is the comprehension of the test constructor's literal message before the cloze blank but goes beyond the information given to predict the content and the way the test constructor will

> present it. The information after the cloze blank and the answers given only go to confirm or reject the anticipated answer.

Inference

According to Furniss (1978) inferencing is:

> ...the ability by the reader to interpret what the writer has said in a current sentence, or to predict future text sentences by relating current text information to earlier text information, prior knowledge, and task demands while reading (p. 24).

The amount of text information interrelated is dependent upon the characteristics and task demands (Thorndyke, 1975). The task demands of the four standardized silent reading tests require that the reader recognize the inference that was generated by the test constructor. The appropriateness of Furniss' definition can be seen by examining McLeod's definition of inference (McLeod, 1978) which is the "cognitively generated information based on explicit linguistic and non-linguistic information provided in the context of continuous written discourse and which was previously unstated" (p. 19).

Since the answers are already given, the reader is not "cognitively generating" information but merely recognizing the inferences generated by the test constructor. Therefore, McLeod's definition cannot apply to the four stated tests. Instead of "unstated" information, the test format provides alternative answers which dictate the type of information interrelated to arrive at the best

choice or answer. Furniss' definition provides less restrictions in developing a definition for this study.

Several factors have to be considered in formulating a definition of inferencing. Certain passages of the reading tests are not continuous written discourse so the process of inferencing would be sensitive to the text characteristics of the test passages (Thorndyke, 1975). A more flexible definition of text characteristics that includes relating information from a word to a passage level is provided in Furniss' definition. In addition, it states the diversity of definitions for inferencing (Furniss, 1978) as well as the complexity of the process of inferencing (McLeod, 1978; Furniss, 1978). A complete study on the nature of standardized tests to assess inferencing would be required to discuss the multi-facets of the process. This study will confine the analysis of inferencing to a global definition since the complexity of the process of inferencing was not well published at the time of the construction of the stated silent reading tests.

The global nature of the definition of inferencing, together with task demands and text characteristics, produced the following definition of inferencing to be used in this study.

> Inferencing is the process of recognizing in the response mode the interpretation of information generated by the test constructors by relating current

text information of the test to earlier text information, prior knowledge, and task demands.

The previous example from the Gates-MacGinitie Reading Test exhibits the process of inferencing:

> Skin divers who go into very cold water may wear a rubber suit for __1__.
>
> 1. insulation style food lubrication
> A B C D

The test item requires the relating of text information, current and earlier, to prior knowledge using the task demands of cloze-multiple choice.

Classification

Barrett's Taxonomy of the Cognitive and Affective Dimensions of Reading place classifying under reorganization. Reorganization requires the student to analyze, synthesize, and/or organize ideas or information explicitly stated in a passage. These actions upon the ideas or information require classifying to place people, things, places, and/or events into categories. Therefore, a student must identify and match more than one component and group by commonality. The following excerpt, item 50, of the Gates-MacGinitie Reading Tests, serves as an explanation sample:

> The Texas Rangers are respected as brave and effective fighting men. Sam Houston preferred Rangers to regular __50__ as defenders of the Texas borders because of their special frontier training.

The answer "troops" matches with the component "fighting

men". The analysis and organization of other information such as "regular" or "defender" allows for the reorganization and synthesis of information to arrive at the correct answer.

> Classifying, then, is the process of reorganizing and synthesizing information to identify or match in the response mode more than one component of an idea or information into a category.

Comparison

According to Gray (1960) the good reader uses comparison as a process to "anticipate and follow the author's ideas, noting their arrangement and sequence, important relationships among them, and the meanings implied by antecedants and referants" (p.13). Gray's statement implies the use of other processes as well as comparison but he acknowledges this when he states that "many mental processes are involved in fusing the new and the old such as analysis, comparison . . ." (p.19). Therefore, comparison is a process that helps in the fusing of new and old information by analyzing and matching information by lining up the differences in the information.

The process of comparison had to be defined precisely since it was not possible to test the reader's use of comparison as he was reading the passage except with the response modes of cloze multiple choice and multiple choice. It was necessary to delineate the process in terms of task demands of the silent reading test. The example

that follows from the Gates-MacGinitie Reading Tests was used to arrive at the definition of comparing for this study:

> Selective breeding is the attempt to develop the best possible plants and animals. Scientists have worked to __15__ the most desirable features into a single __16__.
>
> 15. sell combine deny use declare
> 16. strain battle day house color

Since there is not enough information to answer the blanks without looking at the alternatives, the reader must use the process of comparison and line up the differences to arrive at the correct answers of "combine" and "strain" respectively. The process of comparison in this study is dependent upon the response modes.

> Comparison, then, is the process of analyzing and matching the features of the response modes with the passage information and lining up the differences in features to arrive at an answer.

Generalization

In Gray's (1960) fourth aspect of reading, he states that many mental processes are involved in fusing ideas acquired through reading with previous experience - "inherent in comprehension, critical evaluation, and assimilation is a quality of mind that has been recently called creative thinking" (p. 19). Continuing, he adds, "It involves the imaginative treatment of ideas in both inductive and deductive thinking and results in new insights, fresh ideas, and new organizations or patterns of thoughts" (p. 19). When

the inductive or deductive thinking activates patterns of thought which recognize the similarities between two or more components, the mental process is called generalizing.

Piaget (1966) describes the development of generalizing in a child when he is:

> ...no longer content to explain one phenomenon by another simply by recalling their common history; he wants to connect the two phenomena by a necessary relation. Transductive reasoning yields before the increasing need for combined induction and deduction. Generalization has become possible (p. 191).

It is necessary in defining generalization to define induction and deduction. Induction is the process of reasoning from particular facts to form a general conclusion. Deduction is the process of reasoning from a general conclusion to specific facts. Both demand a necessary relation between the two phenomena.

The delineation of generalization, induction, or deduction in the present study encounters the same problem as other processes. Neither the inductive or deductive generalizations formed were generated by the reader but recognized as generated by the test constructors. The necessity of defining a process in terms of the task demands of the tests became necessary.

An example of generalization was found in item 1 of the Gates-MacGinitie Reading Tests:

> Skin divers who go into very cold water may wear rubber suits for insulation.

The sentence requires the relation of "skin divers", "cold water", and "rubber suits" to inductively arrive at the answer "insulation". An example of deductive generalization would be item 5 of the same test:

> Boll weevils are beetles that lived principally on wild plants until cotton was introduced to the south.

The reader moves from a general conclusion, "wild plants", to a specific fact, "cotton".

Both examples show the necessity of recognizing the similarities between two or more components. They also show the reliance of the generalization on the answers in the response mode. Therefore:

> Generalizing is the process of recognizing the similarities between two or more components in the test passages and response modes to arrive at an inductive or deductive answer. Induction and deduction are used as sub-categories of generalization in this study.

Sequencing

Gray's (1960) major aspects of reading explained how meaning associations are aroused or fused into a sequencing of ideas. This fusing occurs in comprehension. He states that "as the meanings of a passage unfold the good reader anticipates and follows the author's ideas, noting their arrangement and sequence" (p. 13). Therefore, sequencing determines the order that the ideas or information are received in a passage.

Since all the items of the four stated tests require

a fusing of meanings into a stream of ideas at least at the sentence level, sequencing for this study includes only the fusing of ideas beyond the sentence level. The following examples from the Gates-MacGinitie Reading Tests will serve as an example of sequencing:

> The number sentence 2 + 8 = 8 + 2 is an instance of the commutative principle of addition. This __41__ describes a property of the number system. The principle is: the __42__ in which we add two numbers has no __43__ on the sum.

The answers "principle" (41), "order" (42), and "effect" (43) require the processing of sequencing to fuse the meanings into a stream of ideas.

> For this study, sequencing is the process of fusing meanings into a stream of ideas which are ordered beyond the sentence level.

Restatement

Restatement is the process of recognizing that one is restating what has been said. An example from the Gates-MacGinitie Reading Tests explicates this process.

> The mountain people of Lapland wander south in the winter. In summer they go north to pasture their herds of reindeer. While there, they make cheese to take __3__ with them when the cold weather comes.
>
> 3. south north cold heat from
> A B C D E

The best answer, "south", is a restatement of what has been said in previous sentences. The response is a combination of information from the passage and the best alternative

from the response mode. In this study:

> ...restating is the process of recognizing that the best alternative from the response mode is repeating what has been previously stated in the passage.

Discourse Synthesis

A previous section on general processes has defined synthesis. Depending on the syntactical structures, there are several types of synthesis. Phrase and sentence synthesis have been previously defined. Discourse synthesis contains more than one sentence.

Discourse synthesis was the type of synthesis deemed not to be general to the nature of testing. It was thus classified as a selected process. Discourse synthesis uses the same definition of synthesis as phrase and sentence synthesis. It obtained its different classification from the general process by requiring the interrelation of information beyond a sentence level. Discourse synthesis is defined as:

> ...the process of recall of a number of associations beyond the sentence level and the reconstruction of these associations into a framework of meaning by the recognition of the best alternatives of the response modes.

SUMMARY

The delineation of the reading comprehension processes revealed two categories of processes - general and selected processes. The revised definitions of the general processes and the selected processes were constructed to accommodate

the nature of testing and the nature of testing reading comprehension.

The definitions of the general processes are as follows:

Recognizing - the process of obtaining the syntactic and semantic meaning in context.

Associating - the process of combining past experience with the verbal meaning of a word or words recognized.

Judging - the process of selecting the best choice or answer from the alternatives given by selecting and weighing the facts in the passage and checking that choice in light of the alternatives.

Synthesis - the process of recall of a number of associations, as determined by the syntactical structure, and the reconstruction of these associations into a framework of meaning by the recognition of the best alternative in the response mode.

"Phrase" and "sentence" are terms used to describe the syntactical structures relative to the synthesis in the general processes.

The following are the definitions of the selected processes:

Prediction - the process of comprehending the test constructor's literal message before the cloze blank but going beyond the information given to predict the content and the way the test constructor will

present it.

Inference - the process of recognizing in the response mode the interpretation of information generated by the text constructor by relating current text information of the tests to earlier text information, prior knowledge, and task demands.

Classification - the process of reorganizing and synthesizing information to identify or match in the response mode more than one component of an idea or information into a category.

Comparison - the process of analyzing and matching the features of the response modes with the passage information and lining up the differences in features to arrive at an answer.

Generalization - the process of recognizing the similarities between two or more components in the test passages and response modes to arrive at an inductive or deductive answer. Induction is the process of reasoning from particular facts to form a general conclusion. Deduction is the process of reasoning from a general conclusion to specific facts.

Sequencing - the process of fusing meanings into a stream of ideas beyond the sentence level.

Restatement - the process of recognizing that the best alternative from the response mode

is repeating what has been previously stated in the passage.

Discourse Synthesis - the process of synthesis using syntactical structures beyond the sentence level.

The following Chapter will discuss the analyses and findings of the study.

CHAPTER V

THE ANALYSES AND FINDINGS OF THE STUDY

Fifteen processes were redefined and used to analyze each item of the selected tests for general and selected processes. Table 5-1 gives the raw and percentage scores of the processes required to complete each item of the four tests. These results reveal the existence of general and selected processes for the given test formats.

GENERAL PROCESSES

Chapters III and IV discussed the existence of certain general processes which are the product of the test formats. Table 5-1 confirms that the following processes - recognition, association, judgement, phrase synthesis and sentence synthesis - are processes general to the stated tests. Examination of the sections of the tests other than reading comprehension reveal that these processes are also present in these sections. Chapter III provides background literature which stated that there are some processes general to the nature of testing (Guilford, 1960). Table 5-1 provides the information as to which processes are general in these tests. The processes may vary according to content, product and operations (Guilford, 1960).

Table 5-1

Raw and Percentage Scores of the General and Selected Processes for the Four Stated Standardized Tests

		Metropolitan Achievement Test		Gates-MacGinitie Reading Test		Stanford Achievement Test		Canadian Tests of Basic Skills	
		No. of Items 45		No. of Items 52		No. of Items 60		No. of Items 99	
		Scores		Scores		Scores		Scores	
	Processes	Raw	Percentage	Raw	Percentage	Raw	Percentage	Raw	Percentage
GENERAL	Recognition	45	100	52	100	60	100	99	100
	Association	45	100	52	100	60	100	99	100
	Judgement	45	100	52	100	60	100	99	100
	Phrase Synthesis	45	100	52	100	60	100	99	100
	Sentence Synthesis	45	100	52	100	60	100	99	100
SELECTED	Prediction	0	0	27	51.9	33	55.0	0	0
	Inference	45	100	52	100	57	95.0	78	78.8
	Classification	3	6.7	12	23.1	8	13.3	39	39.4
	Comparison	45	100	26	50.0	53	88.3	99	100
	Generalization	28	62.2	33	63.5	42	70.0	66	67.0
	(a) Induction	20	44.4	10	19.2	20	33.3	41	41.4
	(b) Deduction	8	17.8	23	44.3	22	36.7	25	25.6
	Sequencing	30	66.7	33	63.5	51	85.0	79	79.8
	Restatement	32	71.1	10	19.2	21	35.0	43	43.4
	Discourse Synthesis	31	68.9	33	63.5	51	85.0	79	79.8

For the four tests analyzed the general processes of recognition, association, judgement, phrase synthesis and sentence synthesis are processes general to the nature of the tests and, thus, become test phenomena. These general processes address themselves to the question - will any test which involves reading include these processes?

The data from the four stated tests suggests that five general processes stated above may, in fact, be phenomena of test formats in general which are required to be read. Verification could be determined in future studies.

Some of the processes, other than the stated general processes, received scores of 100 percent on some of the tests. These processes did not score 100 percent in all the stated tests. They could not be classified, then, as general processes. Each of these selected processes are to be discussed in the following section on selected processes.

ANALYSES OF SELECTED PROCESSES

This section deals with the comparison of selected processes within and across tests. Percentages were used to discuss the frequency of use of selected processes. Percentages were used to make the comparison since each test contained a difference in the total number of items. The percentages revealed the extent to which a process was being assessed. An inter-test comparison of the

selected processes was possible from the data. Table 5-1 provides the raw and percentage scores of each process.

Table 5-2 represents the averages of the sum of the percentages for selected processes. The average is obtained by dividing the total of the percentages of the selected processes for each test by the number of selected processes, 9. The table is used to make comparisons between a single selected process and all the selected processes in frequency of use. The table is also used to make a comparison of the averages of the frequency of use of the selected processes across the four tests. Table 5-2 reveals that each of the four tests are close in the averages of the frequency of use of the selected processes. In other words, this table tells that the four tests were approximately equal in the average assessment of all the selected processes. This would suggest that not one of the tests examined was superior to the others in the assessment of selected reading-thinking processes. By comparing a single selected process, however, the researcher was able to determine the extent to which a process was assessed. For example, the selected process of classification was found to be present in 13.3 percent of the test items on the Stanford Achievement Test. This is significantly below the average of the selected processes assessed in any of the four tests. Similar comparisons can be made with all the other selected processes within and across tests.

Table 5-2

Averages of the Sum of the Percentages of Selected Processes for each of the Silent Reading Tests.

	Metropolitan	Gates-MacGinitie	Stanford	CTBS
Average	54.2	48.3	58.5	54.2

The following sections will individually discuss each of the selected processes. They will be discussed in the order they appear in Table 5-1. Constant reference to Tables 5-1 and 5-2 will be necessary.

Prediction

Using the definition derived from this study the process of prediction was found not to be assessed by the Metropolitan Achievement Tests and the Canadian Tests of Basic Skills. Both tests contain the response of multiple choice. This response mode does not assess prediction as it is defined in this study. In the above tests, a passage is read and then the reader is asked to answer certain multiple choice questions. Since the reader does not know what information the response modes are requesting, he cannot confirm or check expectations by his knowledge of syntax and knowledge of the world. Rather, he must examine all the alternatives and, through the process of comparison and judgement of the stated material, arrive at an answer. Prediction did not appear to be specifically tested in the

above tests.

Since prediction was not specifically tested in the above tests, the process becomes a phenomenon of the response mode of these tests, multiple choice. The process is a phenomenon of multiple choice in that the response mode does not usually assess prediction as it is defined in this study.

The other two tests did assess the process of prediction. The definitions in Chapter IV provide examples of the process and the response modes. Table 5-1 records the percentage scores at 51.9 for the Gates-MacGinitie Reading Test and 55.0 for the Stanford Achievement Test. The scores indicate that the frequency of use on the two tests (Table 5-1) was similar to the frequency of use of all the selected processes (Table 5-2). The results suggest that the two tests assess prediction with a frequency of use similar to the average frequency of use of all the selected processes.

Inference

The process of inferencing was found to be redundantly scored on the tests requiring the response mode of cloze multiple choice. Only the Gates-MacGinitie Reading Tests and the Stanford Achievement Tests require this response mode. Since this response mode requires filling in the blanks within a passage, then a reader is required "to interpret what the writer has said . . . or to

predict future text sentences by relating current text information to earlier text information, prior knowledge, and task demands while reading" (Furniss, 1978). The task demand of cloze multiple choice requires passage information of at least a sentence in length to generate a response from the alternatives given, thus inferencing is inevitable.

The reader is required to recognize a given inference by interrelating stated information with prior knowledge. The reader is not necessarily generating his own inference but recognizing an inference generated by the test constructors. Inference, then, becomes a phenomenon of the response mode of cloze multiple choice.

Inferencing was found to be necessary in all items of the Metropolitan Achievement Tests and the majority of the Canadian Tests of Basic Skills (78.8%). The fact that both these tests did not require the process of inferencing in all their items suggests that inferencing is not a phenomenon of the response mode, multiple choice. The researcher could only speculate that the questions asked in the Metropolitan Achievement Tests made it necessary to use inferencing to answer each question. In addition, the type of passage could account for a high percentage score of the process. The questions asked, however, appear to be the basic difference in the percentages.

A comparison of the percentage scores for inferencing with the average percentage scores for selected processes

in Table 5-1 suggests that the frequency of use of inferencing is above the average frequency for each of the four tests (see Table 5-2).

Classification

Table 5-1 reports the frequency of use of classification as ranging from 6.7 to 39.4. These results suggest that the frequency of use of classification is less than the frequency of use of all the selected processes. The results do not suggest necessarily that classification is inadequately tested but that the frequency of use in the four tests is less than the majority of the other processes.

Comparison

The process of comparison was used in all items of the Metropolitan Achievement Tests and the Canadian Tests of Basic Skills. In these tests the test items demanded a response mode of multiple choice. The task demands require the process of judging to weigh and select information. In addition, the reader is required to compare the alternatives given in the response mode. The task demands, then, are the same as the process of comparison described in Chapter IV, that is, analyzing and matching the features of the response mode with the passage of information. Comparison thus becomes another phenomenon of the response mode of multiple choice.

The response mode, cloze multiple choice, does not

always require the process of comparison. The reader is able to make judgements of the best choice without looking necessarily at all the alternatives in the response mode. The response mode of cloze-multiple choice is found in the Gates-MacGinitie Reading Test and the Stanford Achievement Test. These tests assessed comparison in 50.0 and 88.3 percent of their items respectively.

A comparison of these results with the average percentage scores for selected processes indicate the Gates-MacGinitie Reading Test is similar and the Stanford Achievement Test is above average in frequency of use of the process of comparison.

Generalization

The range for the frequency of use for the process of generalization is 62.2 to 70.0. In addition, the Table 5-1 reveals the range for the sub-headings of generalization to be 19.2 to 44.4 for induction and 17.8 to 44.3 for deduction. The scores for the process of generalization show a consistency across the four tests. In addition, the frequency of use within each test is above the average for the selected processes. The difference in the scores comes in the analysis of the sub-headings of generalization.

The sub-headings of induction and deduction reveal that three of the four tests are not similar in their assessment of induction or deduction. The respective

scores for induction and deduction are 44.4 and 17.8 on the Metropolitan Achievement Tests, 19.2 and 44.3 on the Gates-MacGinitie Reading Test, 33.3 and 36.7 on the Stanford Achievement Test, and 41.4 and 25.6 on the Canadian Tests of Basic Skills. The Metropolitan Achievement Tests and the Canadian Tests of Basic Skills almost double the frequency of use of induction over deduction. The Gates-MacGinitie Reading Tests double the use of deduction over induction. Only the Stanford Achievement Test was similar in the frequency of use of induction and deduction. Such information is useful in determining which tests may be used to assess the sub-headings of generalization.

Sequencing

The process of sequencing was above the average frequency of use for selected processes. The percentage scores ranged from 63.5 to 83.3.

The lowest score was on the Gates-MacGinitie Reading Tests and suggests that the length of the test passages, usually one to three sentences effects the frequency of use of sequencing. The other three tests with longer passages and a greater number of sentences require a higher frequency of use of the process. Since sequencing is defined in this study as the fusing of meaning beyond the sentence level, the implication is that the frequency of use of sequencing is greatly influenced by the length of the passage.

Restatement

The percentage scores for the process of restatement have the greatest discrepancy in the frequency of use. The scores range from 19.2 to 71.1 percent. Three of the four tests are below the average frequency of use for selected processes for their respective tests. No reason is given for the discrepancy other than to suppose that the test constructors of all the tests other than the Stanford Achievement Test did not want the answers to be restatements of the original passage so as to produce high test scores. The Stanford Achievement Test is the only test with a high frequency of use.

The task demands of the four tests seemed to influence the frequency of use. The two lowest scores mainly employed cloze multiple choice in their tests. The two highest use multiple choice. The task demands of cloze multiple choice do not lend themselves to restatement of passage material with one word responses. Multiple choice can more readily offer phrases or sentences that are restatements of the passages.

Discourse Synthesis

Discourse synthesis was separated from the general processes of phrase and sentence synthesis by definition. Tables 5-1 and 5-2 reveal that discourse synthesis has a high frequency of use when compared to the average frequency of use for the selected processes in each test. The

percentage scores for discourse synthesis range from 63.5 to 85.0. Although the process has a high frequency of use, it cannot be considered a general process as not all items require the process.

SUMMARY OF THE ANALYSIS OF SELECTED PROCESSES

The previous discussion on each of the selected processes has revealed that certain tests assess more effectively certain processes. In addition, the results of Table 5-1 reveal that it is impossible to isolate the general processes from any of the four stated tests. Therefore, these processes are global in nature and can only be assessed in gross terms.

The percentage scores for the selected processes were compared to the average percentage scores for all selected processes to analyze the difference in the frequency of use of the processes within and across tests. The general processes were not considered in the comparison of the frequency of use since these processes were found to be common to each test and global in the nature of testing.

The discussion of the test results of certain selected processes revealed that they were test phenomena of their response modes. The response mode of multiple choice demands the use of comparison but not the use of prediction. Inference becomes a test phenomenon of the response mode of cloze-multiple choice.

In addition, classification is not extensively assessed by all four tests. Restatement is not extensively assessed on three of the tests. Only the Stanford Achievement Test equally assesses induction and deduction, the sub-headings of generalization. Sequencing and discourse synthesis necessitate each other as they are now defined since they obtained equal percentage scores.

The table results indicate that the average percentage of frequency of use of all the selected processes is similar, within 10 percentage points. Table 5-1, however, reveals variation in the percentage of individual selected processes. The difference indicates a variety of processes deemed to be inherent in reading comprehension as assessed by these tests.

CATEGORIZATION OF ITEMS ACCORDING TO PROCESSES

The sum of the within items across processes results are presented in Table 5-3. The results reveal that more than one process is involved in each item. The table indicates the number of processes, out of a total of fourteen processes, necessary to complete each item of the four stated tests. The total number include the five general processes. The inclusion of the general processes provide little information except to show the process complexity of each test item. The total number of selected processes can be obtained by subtracting the five general processes

Table 5-3

Number of Processes, out of a Total of Fifteen Processes, Necessary to Complete each Item of the Metropolitan Achievement Test, Gates-MacGinitie Reading Test, Stanford Achievement Test, and Canadian Tests of Basic Skills

Items*	Tests			
	Metropolitan	Gates-MacGinitie	Stanford	C.T.B.S.
1	12	10	12	12
2	8	9	12	11
3	8	12	12	13
4	12	11	12	12
5	12	10	9	12
6	12	11	11	11
7	8	9	12	11
8	12	9	11	12
9	12	8	10	9
10	12	7	12	12
11	11	9	12	12
12	9	12	12	11
13	10	12	10	10
14	8	13	10	11
15	10	11	9	12
16	12	12	9	12
17	8	10	11	11
18	13	11	13	12
19	12	12	11	13
20	8	11	10	12
21	8	11	8	11
22	11	11	9	12
23	12	9	13	11

*Note: Items 1-99 represent items 80-178 of the Canadian Tests of Basic Skills.

Table 5-3 (continued)

Items	Tests			
	Metropolitan	Gates-MacGinitie	Stanford	C.T.B.S.
24	11	7	13	10
25	12	12	13	9
26	12	8	11	11
27	12	9	13	12
28	7	7	11	10
29	8	8	12	7
30	8	9	11	11
31	10	8	12	7
32	11	12	11	12
33	12	7	11	7
34	9	6	8	13
35	9	8	9	9
36	8	11	10	12
37	12	10	6	11
38	11	11	12	8
39	11	11	7	12
40	12	9	12	9
41	11	10	12	9
42	12	11	9	13
43	11	11	9	9
44	8	8	12	9
45	11	9	12	11
46		11	12	11
47		13	10	11
48		12	13	12
49		7	12	8
50		11	11	10
51		10	12	8
52		13	12	10

Table 5-3 (continued)

Items	Tests			
	Metropolitan	Gates-MacGinitie	Stanford	C.T.B.S.
53			9	8
54			9	8
55			12	7
56			12	10
57			12	9
58			12	10
59			12	9
60			12	11
61				13
62				9
63				11
64				11
65				10
66				11
67				12
68				12
69				7
70				11
71				12
72				11
73				11
74				9
75				9
76				9
77				9
78				9
79				13
80				13
81				8

Table 5-3 (continued)

Items	Tests			
	Metropolitan	Gates-MacGinitie	Stanford	C.T.B.S.
82				12
83				10
84				9
85				9
86				11
87				11
88				12
89				11
90				12
91				11
92				13
93				9
94				10
95				12
96				12
97				10
98				9
99				13

from the number of processes required to complete a particular item. For example, item one of the Metropolitan Achievement Test required 12 processes to complete the item. By subtracting the five general processes, it can be determined that 7 selected processes were needed to complete the item.

The number of selected processes needed to complete an item can be determined in the above fashion. An examination of the table reveals that the number of selected processes required to complete an item of the four stated tests range from two to eight processes.

The results indicate that the tests do not assess only a single reading process as defined in this study. Each item was dependent upon at least two selected processes as well as the general processes. Contamination by other reading processes, then, makes assessment of a single reading process in the stated tests extremely complex.

An analysis of the results of Table 5-3 indicates that a comparison between the tests reveals little information about the processes. There is no pattern evident among the tests. For example, an examination of item 9 shows 12, 8, 10 and 9 processes necessary to complete the item in the four stated tests (see Table 5-3). No pattern is evident in item 9. Similarly, no pattern occurs in the examination of all the other items. As stated earlier, the only information of consequence is that which relates to the complexity of the items. The items of one test do not

appear to be significantly more complex than any of the other stated tests. The average scores for the frequency of use of all the selected processes in Table 5-2 are similar and, thus, substantiate that one test is not significantly more complex than the others.

SUMMARY OF THE ANALYSIS

1. The nature of testing reading comprehension in the four stated tests reveals five general processes that are phenomena of the test formats. The results indicate that some general processes are general to the nature of test formats. The processes may be global in nature and are phenomena of most reading test formats.

2. Task demands and response modes influence the frequency of usage of some of the selected processes. Comparison, inference, and prediction become phenomena of certain response modes and task demands.

3. Most selected processes had a high frequency of use in the four stated tests. Some selected processes, however, had a low frequency of use on all or some of the tests. Variation in the frequency of use suggests a testing of various kinds of reading comprehension.

4. The measurement of a particular selected process was difficult since each item of each test requires more than one selected process to complete the test.

5. The four standardized tests were similar in their frequency of use for the average of the selected

processes.

Chapter VI contains the summary, conclusions and the educational implications of the study.

CHAPTER VI

SUMMARY, CONCLUSIONS AND EDUCATIONAL IMPLICATIONS

SUMMARY

In this study, four commonly used standardized reading tests were analyzed in an attempt to assess the reading processes involved. The findings of this study have provided information that the stated tests do assess reading-thinking processes. The definitions for the processes resulted from the analyses of the tests since the definitions derived from the literature were found to be inadequate. The analyses of the four tests revealed that two categories of reading processes exist for the testing of reading comprehension, namely, general and selective processes. Both categories influence the processing activity of reading comprehension by forcing certain cognitive competency demands on the reader. The different demands of cognitive competencies suggest variations in the kinds of variables of reading comprehension assessed. These variations are dependent upon task demands and response modes of the tests which were assessed.

The research further revealed that it is not feasible to assess a single reading process. Suggestions were

offered as to how to approach the testing of reading comprehension as a processing activity, the major suggestion being, the establishment of a theoretical framework for the testing of reading comprehension.

Five research questions have been examined in this study. The findings and conclusions in this chapter address these questions:

1. What reading comprehension processes do the stated standardized reading tests assess?

2. What is the frequency of use of the reading comprehension processes in these tests?

3. Are some general cognitive processes phenomena of the nature of reading tests formats?

4. Does the test format force certain cognitive competency demands on the reader?

5. If the assumption inherent in research questions 3 and 4 is found to be valid, is it possible to separate reading and cognitive demands and devise test items to assess this?

FINDINGS AND CONCLUSIONS

1. What reading comprehension processes do the stated standardized reading tests assess?

Table 5-1 reveals that all the stated processes, with one exception, are assessed by the four tests used in this study. Prediction, as it is defined in this study, is not assessed in the Metropolitan Achievement Test and the

Canadian Test of Basic Skills.

As was stated earlier in Chapter II, the rationale for process selection considered several factors. Frequency of occurrence, consideration of Guilford's model, and paralleling the processes with the definitions of reading comprehension were the three major criteria. The selection of the stated processes were based on these criteria. Reading processes which were omitted were done so because they did not meet all the criteria. The raw and percentage scores in Table 5-1 indicate that the processes selected for this study were found to be present in the tests analyzed for this study with the exception of prediction. The frequency of use for each of the processes is discussed in research question 2.

2. What is the frequency of use of the reading comprehension processes in these tests?

Table 5-1 reveals that there are two categories established by the frequency of use. The table indicates that there are five processes general to the four tests and ten processes which are selective to the reading comprehension process. The general processes include recognition, association, judgement, phrase synthesis and sentence synthesis. The selected processes are prediction inference, classification, comparison, generalization (induction and deduction), sequencing, restatement and discourse syntehsis. The table reveals the raw and percentage scores for each process for each of the stated

tests.

The scores indicate a wide range in the frequency of use of the processes within and across tests. Table 5-2 reveals the average percentage scores of all the processes combined within and across tests. The table indicates that the four tests are similar in the total percentage of processes assessed. A comparison of Tables 5-1 and 5-2 reveal that most processes had a high frequency of use when compared to the average scores.

As stated earlier there are five processes general to the four tests. They were put into a separate category as they received one hundred percent scores on each of the four tests assessed. Since they were found to be general to each item of the four tests, they were grouped into a category called "general processes".

The second of the categories established by the frequency of use scores in Table 5-1 is "selected processes". The scores vary within and across tests. Inference, comparison, generalization, sequencing, and discourse synthesis were found to be above the averages of the sum of the percentages of selected processes found in Table 5-2. Prediction, classification and restating were found to be below the averages of the sum of the percentages. The variation in the scores seems to suggest that the selected processes are not equally assessed or approximately equally assessed. No criteria is being suggested by the above statement in relation to the frequency of use of each

process and equalization of scores. The only implication stated is the difference in scores within and across tests.

3. Are some general cognitive processes phenomena of the nature of reading test formats?

As stated in question two, there were two categories of processes identified by the scores in Table 5-1. The study verified that there would be some general and selected processes in the tests analyzed (Guilford, 1960). Table 5-1 revealed that there are five processes general to the four tests. The discussion that follows suggests that the five processes are general processes which are phenomena of the nature of the reading test formats.

The nature of the material in reading suggests that the quality of the intellectual abilities and the type of thinking abilities engaged are determined by the material (Guilford, 1960). Guilford further suggests that the nature of testing materials and some reading materials require general thinking abilities as well as some more selected thinking abilities. The types of general thinking abilities assessed by the tests were specific to the task demands of the tests. Since the task demands of the four stated tests are relative to reading comprehension, the types of general processes should be consistent across the four tests. The results of Table 5-1 indicate the five processes are general to the testing of reading comprehension, namely, recognition, association, judgement, phrase synthesis and sentence synthesis.

The five general processes stated above seem to be phenomena of the testing of reading comprehension. There is no suggestion that these processes are general thinking abilities for other types of tests. They may or may not be. They are stated here as being general processes to the task demands of the reading comprehension section of four stated tests. Further study could confirm or deny this generalization to all tests with sections assessing reading comprehension.

4. Does the test format force certain cognitive competency demands on the reader?

The discussions which follow questions 1, 2 and 3 provide the necessary information to address the above question. Question 3 established that general processes were phenomena of the nature of the test formats. The necessity of the reader to employ these general processes to reading forces certain cognitive competency demands. Readers who are not proficient in one or more of these general processes could score poorly on the standardized tests. The standardized test would be biased to a reader with certain cognitive competencies in regards to general cognitive processing.

Similarly, selected processes force certain cognitive competency demands on the reader. The task demands and response modes of the stated tests influenced the frequency of use of some of the selected processes. The processes of comparison, inference and prediction were found to be

phenomena of certain response modes. The absence of prediction in the Metropolitan Achievement Test and the Canadian Test of Basic Skills restricts the cognition of the reader. Whereas these two tests require no use of prediction (see Table 5-1), the Metropolitan Achievement Test and the Gates-MacGinitie Reading Test requires one hundred percent use of the process of inference. The percentage score for inference for the two tests in Table 5-1 is 100 percent. The necessity of comparison in the Metropolitan Achievement Test and C.T.B.S. is evident by the 100 percent scores. The necessity of these processes in certain tests increases the cognitive competency demands on the reader. In addition, the range of the frequency of use for the selected processes alter these demands on the reader. The range in the Metropolitan Achievement Tests and the C.T.B.S. is from zero to 100 percent. The range in the Gates-MacGinitie Reading Test and the Stanford Achievement Test is from 19.2 to 100 percent and 13.3 to 95 percent respectively. The scores of the selected processes in Table 5-1 reflect the range of such demands on the reader. Such a range could greatly restrict the assessment of reading comprehension.

5. If the assumptions inherent in research questions 3 and 4 are found to be valid, is it possible to separate reading and cognitive demands and devise test items to assess this?

The implication of question three is that there are general cognitive processes which are phenomena of the

nature of reading comprehension test formats. These general processes force certain cognitive competency demands on the reader as do the range of frequency of use of the selected processes discussed in question four. The findings of both these questions imply a very complex relationship between reading and cognitive demands. Table 5-3 confirms this complex relationship.

Table 5-3 reveals that each item of the four stated tests requires from 7 to 13 processes to answer one item of any of the tests. The great number of processes involved in the completion of an item shows the complexity of the responses. If the reading and cognitive demands created by the general processes are acknowledged and eliminated from the test items, there are still from 2 to 8 slected processes required to answer a particular item. One single selected process was not assessed by the four stated tests in even one item. From the data, it is not feasible to suggest that an item can be devised to assess one process singly.

EDUCATIONAL IMPLICATIONS

The data obtained in this study leads to several educational implications. The first deals with a theoretical framework. Since the discussion of the comprehensive process found in Chapter II does not provide for a comprehensive theoretical framework of testing reading as a processing activity, such a framework must be created.

Educators and test critics acknowledged a need for a greater understanding of the reading process (Farr, 1968; Schreiner, 1973). Farr and Schreiner extended that need to a creation of a measurement instrument to reflect what is known about cognitive processing. Walker (1973) acknowledged a similar need by stating that the field of reading processes has been fragmentary. Since the reading process and the testing of the reading process require different cognitive competency demands, reading scholars should attempt to integrate the research into a theoretical framework for the testing of the reading process.

This framework can be used to accomplish three things. Firstly, it can serve as a background towards understanding what the reading process is. Secondly, the framework can be used to construct new standardized tests used to assess the processing of a reader. Finally, the framework can be used to analyze other present day standardized tests to see how effectively they assess processing activity.

Several factors have to be considered in constructing a theoretical framework for assessing the reading process. General processes were found to be phenomena of the test formats. Since the test formats affect the processing activities, the theoretical framework must account for such deviations in processing activity and the assessment of this deviation. Figure 6.1 provides one means to account for change in cognitive competency demands. The figure allows for changes in task demands as well as an

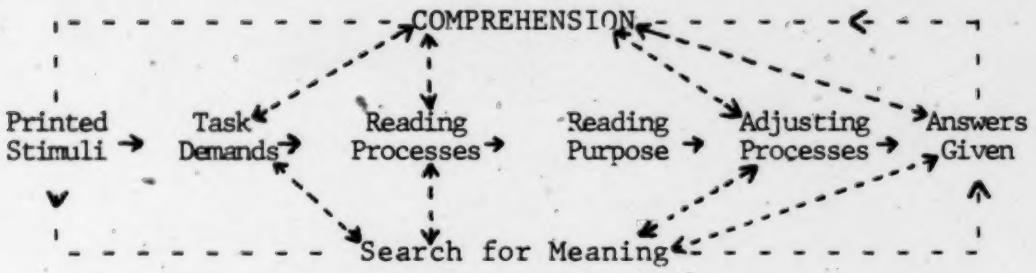

Figure 6-1

Model for Testing of Reading Comprehension

adjusting of cognitive competency demands. The range in the frequency of use of the selected processes requires the reader to adjust his/her cognitive competency demands to the task demands of the test. The adjustment requires a change in the processing behavior of the reader.

A second implication of the findings is the problem of general processes. General processes cannot be isolated from the rest of the processes. It is not feasible or possible to separate processes for assessment. One suggestion is to create sections of tests that are designed to assess one single process regardless of the other processes used. For example, a 25-item section might be designed to assess restatement. Such a test would provide for the adequate assessment of this process and the evaluation of this process would be kept to one section. If such a test was too lengthy, then a test could be created in which every nth question assessed a specific process. This second reading test could be evaluated for general reading comprehension or could be analytically broken down to determine

problems in processing activity.

Such an evaluation of the reading behavior of a student would look at the essential functions of evaluation (Farr, 1969). It would also contribute to a better understanding of the reading process (Goodman, 1968). Finally, by looking consistently at sub-skills or processes constituting reading, reading specialists could increase the validity of the standardized reading tests.

In the construction of tests to assess processing activity, test constructors must take into consideration the content and test format. These two variables provide for deviation in the processing activity. The deviation creates a range in the frequency of use of some of the processes. For example, comparison, inferencing and prediction are influenced by the response modes and task demands of some of the four stated tests. A test constructed without the process of prediction would assess a specific kind or variable of reading comprehension.

The articulation of the cognitive processes involved in reading comprehension is the final implication of this study. Although the averages of the frequency of use for the four stated tests were similar, the variations in the assessment of processing activity suggest differences in the assessment of reading comprehension. Such variations could account for the lack of diagnostic validity put forth by Goodman (1968), Farr (1968), and Simon (1971). Further research is needed in the assessment of processing

activity to further clarify the differences in assessment of reading comprehension. The fact that there are some global processes involved in the assessment of reading comprehension indicates that there are some psychological variables which influence the measurement of reading comprehension. More research is needed to clarify these variables and to determine the exact effect of these variables on the validity of test instruments to assess reading processes.

When such research is completed, test constructors will be able to assess more accurately the specific subskills and/or processes of reading comprehension. The variables and implications put forth in the body of this text should be considered in the creation of a theoretical framework or test for the processing activity of reading comprehension.

BIBLIOGRAPHY

Acland, H. If reading scores are irrelevant, do we have anything better? Educational Technology, 1978, 16, 615-619.

Alberta Education. Report of the task force on the evaluation of standardized achievement tests for Alberta schools: Research Bulletin, 77-5. Alberta Education, 1977.

Aulls, M. W. The acquisition of reading fluency by skilled and less skilled readers in grades one, two and three. Paper presented at the Annual Meeting of the National Reading Conference 27th, New Orleans, La., 1977.

Bartlett, F. Remembering. Cambridge: Cambridge Press, 1932.

Burke, C. L. Review of the Gates-MacGinitie Reading Tests. In O. K. Buros, Reading Tests and Reviews II. New Jersey: Gryphon Press, 1975.

Buros, O. K. Fifty years in testing: Some reminiscences, criticisms, and suggestions. Educational Researcher, 1977, 6, 9-15.

Buros, O. K. Reading Tests and Reviews. New Jersey: Gryphon Press, 1968.

Buros, O. K. Reading Tests and Reviews II. New Jersey: Gryphon Press, 1975.

Carroll, J. The nature of the reading process. In H. Singer and R. Ruddell (eds.), Theoretical Models and Processes of Reading. I. R. A., 1970.

Chall, Jeanne. The great debate: Ten years later, with a model and proposal for reading stages. Paper presented at the Conference on Theory and Practice of Beginning Reading Instruction, Pittsburgh, University of Pa., 1976.

Clarke, Stella. The relationship of language and cognition to reading progress in twelve disabled

readers. Unpublished master's thesis, University of Alberta, 1978.

Craik, F. I., & Lockhart, R. S. Levels of processing: A framework for memory research. Journal of Verbal Learning and Behavior, 1972, 11(6), 671-684.

Farr, Roger. Reading: What Can It Measure? Newark, Delaware: I. R. A., 1969.

Fishbein, J., & Emans, R. A Question of Competence: Language, Intelligence and Learning to Read. Toronto: S. R. A., 1972.

Fisher, D. R. Disfunctions in reading disability: There's more than meets the eye. Paper presented at the Conference on Theory and Practice of Beginning Reading Instruction, University of Pittsburgh, Learning Research and Development Centre, 1976.

Frederiksen, C. Acquisition of semantic information from discourse effects of repeated exposures. Journal of Verbal Learning and Behavior, 1975, 14, 158-169.

Furniss, E. R. Schemas for reading and recall of story narrative and descriptive informational texts: A study of sixth grade proficient readers. Unpublished doctoral dissertation, University of Alberta, 1978.

Gates, A. I. Character and purposes of the yearbook. Reading in the Elementary School (Forty-eighth Yearbook for the National Society for the Study of Education, Part II). Chicago: University of Chicago Press, 1949.

Gates, A. I., & MacGinitie, W. H. Gates-MacGinitie Reading Test, Teacher's Manual, Survey E. New York: Teachers' College, Columbus University, 1965.

Geyer, J. J., & Kolers, P. A. Reading as information processing. In M. J. Voigt (ed.), Advances in Librarianship. New York: Academic Press, 1974.

Goodman, K. S. (ed.) The Psycholoinguistic Nature of the Reading Process. Detroit: Wayne State University Press, 1968.

Goolsby, J. M., & Frary, R. B. Validity of the Nelson Reading Test for a high school reading program. Reading Improvement, 1976, 13, 240-242.

Gray, W. S. The major aspects of reading. In A. Robinson (ed.), Sequential: Development of Reading Abilities.

Supplementary Educational Monographs, No. 90. Chicago: University of Chicago Press, 1960.

Guilford, J. P. Frontiers in thinking that teachers should know about. The Reading Teacher, 1960, 13, 176-182.

Herrick, V. E. Review of the Iowa Tests of Basic Skills. In O. K. Buros, Reading Tests and Reviews. New Jersey: Gryphon Press, 1968.

Hobson, J. R. Review of the Metropolitan Achievement Test. In O. K. Buros, Reading Tests and Reviews. New Jersey: Gryphon Press, 1968.

Hobson, J. R. Review of the Stanford Achievement Test. In O. K. Buros, Reading Tests and Reviews. New Jersey: Gryphon Press, 1968.

Horn, E. V. Methods of Instruction in the Social Studies. New York: Scribner's Pub. Co., 1937.

Hunt, J. T. Selecting a high school reading test. High School Journal, 1955, 39, 49-52.

Huss, H. Critical aspects of comprehension. Elementary English, 1971, 48, 227-234.

Johns, J. L. Do comprehension items really test reading? Sometimes! Journal of Reading, April 1978, 21, 615-619.

Kolers, P. A. Three stages of reading. In H. Levin and J. P. Williams (eds.), Basic Studies in Reading. New York: Basic, 1970.

McKim, M. G. Review of the Metropolitan Achievement Test. In O. K. Buros, Reading Tests and Reviews, New Jersey: Gryphon Press, 1968.

McLeod, R. W. An exploratory study of inference and cognitive synthesis in reading comprehension with selected grade four readers. Unpublished doctoral dissertation, University of Alberta, 1978.

Meyer, B. J. F. Idea units recalled in relation to their position in the logical structure, importance, stability and order in the passages. Unpublished master's thesis, Cornell University, 1971.

Miller, G. A. The Psychology of Communication. Middlesex: Cox and Wyman Ltd., 1967.

Morgan, G. A. Review of the Iowa Tests of Basic Skills. In O. K. Buros, Reading Tests and Reviews. New Jersey: Gryphon Press, 1968.

Neisser, U. Cognitive Psychology. New York: Meredith Pub. Co., 1967.

Norman, D. A. Memory and Attention. New York: J. Wiley & Sons, 1965.

Pearson, D. A psycholinguistic model of reading. Language Arts, March 1976, 53(3), 309-314.

Pflaum, S. The reading process and the beginning reader. In B. S. Schulevitz (ed.), Teachers, Tangibles, Technique. I. R. A., 1975.

Piaget, J. Judgement and Reasoning in the Child. Totowa, N. J.: Littlefield, Adams, 1966.

Powell, W. R. Review of the Gates-MacGinitie Reading Tests. In O. K. Buros, Reading Tests and Reviews II. New Jersey: Gryphon Press, 1975.

Prentice, W. C., & Peterson, J. Beyond passage dependency: A closer look at what reading comprehension tests measure. A paper presented at the Annual Meeting of the National Reading Conference, New Orleans, La., 1977.

Robinson, H. A. Review of the Metropolitan Achievement Test. In O. K. Buros, Reading Tests and Reviews. New Jersey: Gryphon Press, 1968.

Robinson, H. M. Review of the Stanford Achievement Test. In O. K. Buros, Reading Tests and Reviews. New Jersey: Gryphon Press, 1968.

Rodgers, C. D. What standardized reading tests don't tell us and we are afraid to ask. Reading Improvement, 1976, 13, 135-136.

Schreiner, R. Assessing reading comprehension. A paper presented at the Annual Meeting of the I. R. A., Miami, Florida, 1977.

Shank, R. C. The structure of episodes in memory. In D. G. Bobrow, and A. Collins (eds.), Representation and Understanding: Studies in Cognitive Science. New York: Academic Press, 1975.

Simons, H. D. Reading comprehension: The need for a new perspective. Reading Research Quarterly, Spring

1971, VI, No. 3.

Sipay, R. E. A comparison of standardized reading achievement test scores and functional reading levels. Doctoral dissertation, University of Connecticut, 1961.

Smith, Frank. Comprehension and Learning. New York: Holt, Rinehart and Winston, 1975.

Smith, Frank. The role of prediction. Elementary English, 1975, 52, No. 3, 305-311.

Smith, Frank. Understanding Reading. New York: Holt, Rinehart and Winston, 1971.

Smith, R. J., & Barrett, T. C. Teaching Reading in the Middle Grades. Massachusetts: Addison-Wesley Pub. Co., 1974.

Spache, R. Review of the Gates-MacGinitie Reading Tests. In O. K. Buros, Reading Tests and Reviews. New Jersey: Gryphon Press, 1968.

Stauffer, R. G. Teaching Reading as a Thinking Process. New York: Harper & Row, Pub., 1969.

Thorndike, E. Reading as reasoning: A study of mistakes in paragraph reading. Journal of Educational Research, 1917, 8, 323-332.

Thorndyke, P. W. Cognitive Structures in Human Story Comprehension and Memory. Doctoral dissertation Department of Psychology), Stanford University, 1975.

Townsend, A. Review of the Stanford Achievement Test. In O. K. Buros, Reading Tests and Reviews. New Jersey: Gryphon Press, 1968.

Traxler, A. Review of the Stanford Achievement Test. In O. K. Buros, Reading Tests and Review II. New Jersey: Gryphon Press, 1975.

Traxler, A. Standardized test. N. E. A. Journal, Nov. 1959, 48, 18-20.

Walker, L. A comparative study of selected reading and listening processes. Unpublished doctoral dissertation, University of Alberta, 1973.

APPENDICES

APPENDIX A1

SCORE SHEET FOR METROPOLITAN ACHIEVEMENT TEST

Processes	Items																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inference	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Classification	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	+
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Generalization	+	-	-	+	+	+	-	+	+	+	+	-	+	-	-	+	-	+
Induction	+	-	-	+	+	-	-	+	+	+	-	-	+	-	-	+	-	-
Deduction	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	+
Sequencing	+	-	-	+	+	+	-	+	+	+	+	+	-	-	+	+	-	+
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	+	+	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	+	-	-	+	+	+	-	+	+	+	+	+	-	-	+	+	-	+

APPENDIX A1 (continued)

SCORE SHEET FOR METROPOLITAN ACHIEVEMENT TEST

Processes	Items																	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inference	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Classification	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Generalization	+	-	-	+	+	+	+	+	+	-	-	-	-	+	+	-	-	-
Induction	+	-	-	+	-	-	-	+	+	-	-	-	-	+	+	-	-	-
Deduction	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-
Sequencing	+	-	-	+	+	+	+	+	+	-	-	-	+	+	+	+	-	-
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	+	+	+	-	+	-	+	+	+	-	+	+	+	-	+	-	+	+
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	+	-	-	+	+	+	+	+	+	-	-	-	+	+	+	+	-	-

APPENDIX A1 (continued)

SCORE SHEET FOR METROPOLITAN ACHIEVEMENT TEST

Processes	Items									Raw	%
	37	38	39	40	41	42	43	44	45	Score	Score
Recognition	+	+	+	+	+	+	+	+	+	45/45	100.0
Association	+	+	+	+	+	+	+	+	+	45/45	100.0
Prediction	-	-	-	-	-	-	-	-	-	0/45	0.0
Inference	+	+	+	+	+	+	+	+	+	45/45	100.0
Classification	-	-	-	-	-	-	-	-	-	3/45	6.7
Comparison	+	+	+	+	+	+	+	+	+	45/45	100.0
Generalization	+	+	+	+	+	+	+	-	+	28/45	62.2
Induction	+	-	+	+	+	+	+	-	-	20/45	44.4
Deduction	-	+	-	-	-	-	-	-	+	8/45	17.8
Sequencing	+	+	+	+	+	+	+	-	+	30/45	66.7
Judging	+	+	+	+	+	+	+	+	+	45/45	100.0
Restating	+	-	-	+	-	+	-	+	-	32/45	71.1
Phrase Synthesis	+	+	+	+	+	+	+	+	+	45/45	100.0
Sentence Synthesis	+	+	+	+	+	+	+	+	+	45/45	100.0
Discourse Synthesis	+	+	+	+	+	+	+	-	+	31/45	68.9

APPENDIX A2

SCORE SHEET FOR GATES-MacGINITIE READING TESTS

Processes	Items																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	+	-	-	+	-	-	-	-	+	-	+	+	-	+	-	+	+	-	+
Inference	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Classification	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	-	-	+	-
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+
Generalization	+	+	+	+	+	+	+	+	-	-	-	+	+	+	+	+	-	+	+
Induction	-	-	+	-	-	+	-	-	-	-	-	+	-	-	-	-	-	+	-
Deduction	+	+	-	+	+	-	+	+	-	-	-	-	+	+	+	+	-	-	+
Sequencing	-	-	+	+	-	+	-	-	-	-	-	+	+	+	+	+	+	+	+
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	-	-	+	-	-	+	-	-	-	-	+	+	+	+	+	+	+	+	+

APPENDIX A2 (continued)

SCORE SHEET FOR GATES-MacGINITIE READING TESTS

Processes	Items																		
	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	-	+	+	+	+	-	-	+	+	+	-	-	+	+	-	-	-	-	-
Inference	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Classification	-	-	-	+	-	+	-	+	-	-	-	-	-	-	-	+	-	-	-
Comparison	+	-	-	+	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-
Generalization	+	+	+	-	-	+	-	+	-	-	-	-	+	-	-	-	+	+	+
Induction	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	-
Deduction	+	-	+	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	+
Sequencing	+	+	+	-	-	+	+	-	-	-	+	+	+	-	-	-	+	+	+
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-	+	+	-	+
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	+	+	+	-	-	+	+	-	-	-	+	+	+	-	-	-	+	+	+

APPENDIX A2 (continued)

SCORE SHEET FOR GATES-MacGINITIE READING TESTS

Processes	Items														Raw	%
	39	40	41	42	43	44	45	46	47	48	49	50	51	52	Score	Score
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	52/52	100.0
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	52/52	100.0
Prediction	+	-	+	-	+	-	+	+	+	-	+	+	+	+	27/52	51.9
Inference	+	+	+	+	+	+	+	+	+	+	+	+	+	+	52/52	100.0
Classification	-	-	-	-	-	-	-	-	+	+	-	+	-	+	12/52	23.1
Comparison	-	-	-	-	-	-	-	-	+	+	-	+	-	+	26/52	50.0
Generalization	+	-	-	+	+	+	-	+	+	+	-	+	-	+	33/52	63.5
Induction	-	-	-	+	-	-	-	-	-	-	-	+	-	-	10/52	19.2
Deduction	+	-	-	-	+	+	-	+	+	+	-	-	-	+	23/52	44.3
Sequencing	+	+	+	+	+	-	+	+	+	+	-	-	+	+	33/52	63.5
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	52/52	100.0
Restating	-	+	+	+	-	-	-	-	-	-	-	-	+	-	10/52	19.2
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	52/52	100.0
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	52/52	100.0
Discourse Synthesis	+	+	+	+	+	-	+	+	+	+	-	-	+	+	33/52	63.5

APPENDIX A3

SCORE SHEET FOR STANFORD ACHIEVEMENT TEST

Processes	Items																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	-	-	+	+	-	-	+	+	+	+	+	-	+	+	-	-	-	+	-	-	-	+
Inference	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+	+
Classification	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Generalization	+	+	+	+	-	+	+	-	+	+	+	+	-	-	-	-	+	+	+	+	-	-
Induction	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	+	+	-	-
Deduction	-	-	+	+	-	+	+	-	+	+	-	+	-	-	-	-	-	+	-	-	-	-
Sequencing	+	+	+	+	-	+	+	+	-	+	+	+	+	+	+	+	+	+	+	-	-	-
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	+	+	-	-	+	-	-	+	-	-	-	+	-	-	+	-	-	+	-	-	+	+
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	+	+	+	-	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	-	-	-

APPENDIX A3 (continued)

SCORE SHEET FOR STANFORD ACHIEVEMENT TEST

Processes	Items																					
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	+	+	+	-	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-	+	-	+
Inference	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+
Classification	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	-	-	+	-	-	-
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	-	+	+	-	+	+
Generalization	+	+	+	+	+	-	+	+	+	+	+	-	-	+	-	+	-	+	+	-	-	+
Induction	-	-	-	+	+	-	+	-	+	+	+	-	-	-	-	+	-	-	+	-	-	+
Deduction	+	+	+	-	-	-	-	+	-	-	-	-	-	+	-	-	-	+	-	-	-	-
Sequencing	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-	+	-	+	+	+	+	+
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	+	+	+	-	+	+	-	-	-	-	-	+	-	+	+	-	+	+	-	-	-	-
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	+	+	+	+	+	+	+	+	+	+	+	-	+	-	-	+	-	+	+	+	+	+

APPENDIX A3 (continued)

SCORE SHEET FOR STANFORD ACHIEVEMENT TEST

Processes	Items																Raw	%
	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	Score	Score
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	60/60	100.0
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	60/60	100.0
Prediction	+	+	+	-	+	-	+	+	+	-	+	+	+	+	+	+	33/60	55.0
Inference	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	57/60	95.0
Classification	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	8/60	13.3
Comparison	+	+	-	+	-	+	+	+	-	+	+	+	+	+	+	+	53/60	88.3
Generalization	+	+	-	+	+	+	+	+	-	-	+	+	+	+	+	+	42/60	70.0
Induction	+	+	-	+	-	+	-	-	-	-	+	-	-	-	-	-	20/60	33.3
Deduction	-	-	-	-	+	-	+	+	-	-	-	+	+	+	+	+	22/60	36.7
Sequencing	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	51/60	85.0
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	60/60	100.0
Restating	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	21/60	35.0
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	60/60	100.0
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	60/60	100.0
Discourse Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	51/60	85.0

APPENDIX A4

SCORE SHEET FOR CANADIAN TESTS OF BASIC SKILLS

Processes	Items																				
	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inference	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+
Classification	-	-	+	+	+	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Generalization	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Induction	+	+	+	-	-	+	+	+	+	+	+	+	-	+	+	+	+	+	-	+	-
Deduction	-	-	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	+
Sequencing	+	+	+	+	+	+	+	+	-	+	+	+	-	+	+	+	+	+	+	+	+
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	+	-	+	-	+	-	-	+	-	+	-	-	+	+	+	+	+	-	+	+	-
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	+	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	-	+	+	+	+

APPENDIX A4 (continued)

SCORE SHEET FOR CANADIAN TESTS OF BASIC SKILLS

Processes	Items																				
	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inference	+	+	+	+	+	+	+	+	+	-	+	-	+	-	+	+	+	+	-	+	+
Classification	+	-	-	-	-	-	-	-	-	-	+	+	+	-	+	-	-	+	+	-	+
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Generalization	+	+	+	+	+	+	-	-	+	-	+	-	+	-	+	+	-	+	-	-	+
Induction	-	-	+	+	-	-	-	-	+	-	-	-	-	-	-	+	-	+	-	-	+
Deduction	+	+	-	-	+	+	-	-	-	-	+	-	+	-	+	-	-	-	-	-	-
Sequencing	+	+	-	-	+	+	+	-	+	-	+	-	+	+	+	+	-	+	+	+	+
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	-	-	+	-	-	+	+	-	-	+	-	-	-	+	-	-	+	-	-	-	+
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	+	+	-	-	+	+	+	-	+	-	+	-	+	+	+	+	-	+	+	+	+

APPENDIX A4 (continued)

SCORE SHEET FOR CANADIAN TESTS OF BASIC SKILLS

Processes	Items																				
	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inference	+	-	-	+	+	+	-	+	-	+	+	+	+	+	-	+	+	+	+	+	+
Classification	-	+	+	-	-	+	+	-	+	-	+	+	-	-	-	-	-	-	+	-	-
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Generalization	-	-	+	+	+	+	-	+	-	+	-	-	-	-	-	+	-	+	+	-	+
Induction	-	-	-	+	-	-	-	+	-	+	-	-	-	-	-	-	-	+	-	-	+
Deduction	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-
Sequencing	+	+	+	+	+	+	-	+	-	-	-	-	-	+	+	-	+	+	+	+	+
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	-	-	-	-	-	-	+	-	+	+	-	-	-	+	+	+	-	-	+	-	-
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	+	+	+	+	+	+	-	+	-	-	-	-	-	+	+	-	+	+	+	+	+

APPENDIX A4 (continued)

SCORE SHEET FOR CANADIAN TESTS OF BASIC SKILLS

Processes	Items																				
	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Prediction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Inference	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+	+	+	-	+	+	-
Classification	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Generalization	+	+	+	+	+	-	+	+	+	+	-	-	-	-	-	+	+	-	+	-	-
Induction	+	+	+	-	-	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-
Deduction	-	-	-	+	+	-	-	-	+	+	-	-	-	-	-	-	+	-	+	-	-
Sequencing	+	-	+	+	+	-	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Restating	-	+	-	+	+	-	-	+	-	-	-	-	-	-	-	+	+	+	-	-	-
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Discourse Synthesis	+	-	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+

APPENDIX A4 (continued)

SCORE SHEET FOR CANADIAN TESTS OF BASIC SKILLS

Processes	Items															Raw	%
	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	Score	Score
Recognition	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	99/99	100.0
Association	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	99/99	100.0
Prediction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0/99	0.0
Inference	-	-	-	+	+	+	+	+	-	-	+	+	-	-	+	78/99	78.9
Classification	-	-	-	+	-	-	-	+	-	+	+	+	+	+	+	39/99	39.4
Comparison	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	99/99	100.0
Generalization	-	+	+	+	+	+	+	+	-	-	+	+	-	-	+	66/99	66.7
Induction	-	+	+	-	+	+	+	-	-	-	+	+	-	-	+	41/99	41.4
Deduction	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	25/99	25.6
Sequencing	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	79/99	79.8
Judging	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	99/99	100.0
Restating	+	+	+	-	-	+	-	+	+	+	-	-	+	+	+	43/99	43.4
Phrase Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	99/99	100.0
Sentence Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	99/99	100.0
Discourse Synthesis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	79/99	79.8

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